

















THE IMPERIAL ENCYCLOPEDIA  
AND DICTIONARY

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KNOWLEDGE AND AN UN-  
ABRIDGED DICTIONARY OF  
THE ENGLISH LANGUAGE  
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IN FORTY VOLUMES

VOLUME 12  
DOMINIS—ELECTRIC FISH

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NEW YORK HENRY G. ALLEN & COMPANY

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# SCHEME OF SOUND SYMBOLS

## FOR THE PRONUNCIATION OF WORDS.

**Note.**—(·) is the mark dividing words respelt phonetically into syllables; (ˈ), the accent indicating on which syllable or syllables the accent or stress of the voice is to be placed.

Sound-symbols employed in Respelling.	Representing the Sounds as exemplified in the Words.	Words respelt with Sound-symbols and Marks for Pronunciation.
ā	mate, fate, fail, aye	māt, fāt, fāl, ā.
ă	mat, fat	măt, făt.
â	far, calm, father	fâr, kām, fâ'thēr.
ā	care, fair	cār, fār.
aw	fall, laud, law	fawl, lawd, law.
ē	mete, meat, feet, free	mēt, mēt, fēt, frē.
ě	met, bed	mět, bēd.
é	her, stir, heard, cur	hēr, stēr, hērd, kēr.
ī	pine, ply, height	pīn, plī, hīt.
ĩ	pin, nymph, ability	pĩn, nĩmf, ă-bĩl'ĩ-tĩ.
ō	note, toll, soul	nōt, tōl, sōl.
ō	not, plot	nōt, plōt.
ô	move, smooth	môv, smôth.
ō	Goethe (similar to e in her)	gō'tēh.
ow	noun, bough, cow	noun, bow, kow.
oy	boy, boil	boy, boyl.
û	pure, dew, few	pūr, dū, fū.
ũ	bud, come, tough	būd, kũm, tũf.
ú	full, push, good	fúl, púsh, gúd.
ü	French plume, Scotch guid	plüm, güd.
ch	chair, match	chār, mäch.
ch	German buch, Heidelberg, Scotch loch (guttural)	bóch, hĩ'del-běrch, löch.
g	game, go, gun	gām, gō, gũn.
j	judge, gem, gin	jűj, jēm, jĩn.
k	king, cat, cot, cut	kĩng, kăt, kót, kűt.
s	sit, scene, cell, city, cypress	sĩt, sēn, sēl, sīt'ĩ, sĩ'prēs.
sh	shun, ambition	shũn, ăm-bish'ũn.
th	thing, breath	thĩng, brěth.
th	though, breathe	thō, brěth.
z	zeal, maze, muse	zēl, māz, mūz.
zh	azure, vision	ăzh'ēr, vĩeh'ũn.



# ABBREVIATIONS USED IN THIS WORK.

a., or adj....adjective  
A.B.....Bachelor of Arts  
abbr.....abbreviation, abbreviated  
abl. or abla.ablative  
Abp.....Archbishop  
abt.....about  
Acad.....Academy  
acc. or ac..accusative  
accom.....accommodated, accommodation  
act.....active  
A.D.....in the year of our Lord [*Anno Domini*]  
Adj. ....Adjutant  
Adm. ....Admiral  
adv. or ad.adverb  
A. F.....Anglo-French  
Ag.....Silver [*Argentum*]  
agri.....agriculture  
A. L.....Anglo-Latin  
Al.....Aluminium  
Ala.....Alabama  
Alb.....Albanian  
alg.....algebra  
A.M.....before noon [*ante meridiem*]  
A.M.....Master of Arts  
Am.....Amos  
Amer.....America, -n  
anat.....anatomy, anatomical  
anc.....ancient, anciently  
AN. M. ...., in the year of the world [*Anno Mundi*]  
anon.....anonymous  
antiq.....antiquity, antiquities  
aor.....aorist, -ic  
app.....appendix  
appar.....apparently  
Apr.....April  
Ar.....Arabic  
arch.....architecture  
archæol...archæology  
arith.....arithmetic  
Ark.....Arkansas  
art.....article  
artil.....artillery  
A.S.....Anglo-Saxon  
As.....Arsenic  
Assoc.....Association  
asst.....assistant  
astrol.....astrology  
astron... astronomy  
attrib.....attributive  
atty.....attorney  
at. wt.....atomic weight  
Au.....Gold [*Aurum*]

A.U.C.....in the year of the building of the city (Rome) [*Annourbis conditæ*]  
Aug.....August  
aug.....augmentative  
Aust.....Austrian  
A. V.....authorized version [of Bible, 1611]  
avoir.....avoirdu pois  
B.....Boron  
B.....Britannic  
b.....born  
Ba.....Barium  
Bart.....Baronet  
Bav.....Bavarian  
bl.; bbl....barrel; barrels  
B.C.....before Christ  
B.C.L.....Bachelor of Civil Law  
B.D.....Bachelor of Divinity  
bef.....before  
Belg.....Belgic  
Beng.....Bengali  
Bi.....Bismuth  
biog.....biography, biographical  
biol.....biology  
B.L.....Bachelor of Laws  
Boheny....Bohemian  
bot.....botany, botanical  
Bp.....Bishop  
Br.....Bromine  
Braz.....Brazilian  
Bret.....Breton  
Brig.....Brigadier  
Brit.....British, Britannica  
bro.....brother  
Bulg.....Bulgarian  
bush.....bushel, bushels  
C.....Carbon  
c.....century  
Ca.....Calcium  
Cal.....California  
Camb.....Cambridge  
Can.....Canada  
Cant.....Canterbury  
cap.....capital  
Capt.....Captain  
Card.....Cardinal  
carp.....carpentry  
Cath.....Catholic  
caus.....causative  
cav.....cavalry  
Cd.....Cadmium  
Ce.....Cerium  
Celt.....Celtic  
cent.....central  
cf.....compare [*confer*]  
ch or chh...church



# ABBREVIATIONS.

Chal.....	Chaldee	diff.....	different, difference
chap.....	chapter	dim.....	diminutive
chem.....	chemistry, chemical	dist... ..	district
Chin.....	Chinese	distrib... ..	distributive
Chron.....	Chronicles	div.....	division
chron.....	chronology	doz.....	dozen
Cl.....	Chlorine	Dr.....	Doctor
Class.....	Classical [= Greek and Latin]	dr.....	dram, drams
Co.....	Cobalt	dram.....	dramatic
Co.....	Company	Dut. or D...	Dutch
co....	county	dwt .....	pennyweight
cog.....	cognate [with]	dynam or dyn.....	dynamics
Col.....	Colonel	E.....	Erbium
Col....	Colossians	E. or e....	East, -ern, -ward
Coll.....	College	E. or Eng..	English
colloq.....	colloquial	Ecc.....	Ecclesiastes
Colo.....	Colorado	eccl. or } ecclesiastical [af-	
Com.....	Commodore	eccles.... }	fairs]
com.....	commerce, commer- cial	ed .....	edited, edition, edi- tor
com.....	common	e.g.....	for example [ex gratia]
comp.....	compare	E. Ind. or }	East Indies, East
comp .....	composition, com- pound	E. I. .... }	Indian
compar....	comparative	elect.....	electricity
conch .....	conchology	Emp..	Emperor
cong.....	congress	Encyc.....	Encyclopedia
Congl.....	Congregational	Eng. or E..	English
conj .....	conjunction	engin.....	engineering
Conn or Ct.	Connecticut	entom ..	entomology
contr.....	contraction, con- tracted	env. ext....	envoy extraordinary
Cop.....	Coptic	ep.....	epistle
Cor.....	Corinthians	Eph .....	Ephesians
Corn.....	Cornish	Episc .....	Epi-copal
corr.....	corresponding	eq. or =...	equal, equals
Cr.....	Chromium	equiv.....	equivalent
crystal.....	crystallography	esp.....	especially
Cs.....	Cæsium	Est .....	Esther
ct.....	cent	estab.....	established
Ct. or Conn.	Connecticut	Esthon.....	Esthonian
Cu.....	Copper [ <i>Cuprum</i> ]	etc.....	and others like [et cetera]
cwt .....	a hundred weight	Eth.....	Ethiopic
Cyc.....	Cyclopedia	ethnog.....	ethnography
D.....	Didymium	ethnol.....	ethnology
D. or Dut..	Dutch	et seq.....	and the following [et sequentia]
d.....	died	etym.....	etymology
d. [l. s. d.]	penny, pence	Eur.....	European
Dan.....	Daniel	Ex.....	Exodus
Dan.....	Danish	exclam ..	exclamation
dat .....	dative	Ezek.....	Ezekiel
dau.....	daughter	Ezr.....	Ezra
D. C.....	District of Columbia	F.....	Fluorine
D.C.L.....	Doctor of Civil [or Common] Law	F. or Fahr.	Fahrenheit
D.D.....	Doctor of Divinity	f. or fem...	feminine
Dec.....	December	F. or Fr....	French
dec.....	declension	fa.....	father
def.....	definite, definition	Fahr. or F.	Fahrenheit
deg.....	degree, degrees	far.....	farriery
Del.....	Delaware	Fe.....	Iron [ <i>Ferrum</i> ]
del.....	delegate, delegates	Feb.....	February
dem.....	democratic	fem or f. .	feminine
dep.....	deputy	fig.....	figure, figuratively
dep.....	deponent	Fin.....	Finnish
dept.....	department	F.—L.....	French from Latin
deriv.....	derivation, deriva- tive	Fla.....	Florida
Deut.....	Deuteronomy	Flem.....	Flemish
dial.....	dialect, dialectal	for.....	foreign
diam... ..	diameter	fort.....	fortification
Dic.....	Dictionary	Fr. or F..	French
		fr....	from

# ABBREVIATIONS.

freq.....frequentative	ind.....indicative
Fris .....Frisian	indef.....indefinite
ft.....foot, feet	Indo-Eur...Indo-European
fut.....future	inf.....infantry
G. or Ger...German	inf or infin.infinite
G.....Glucinium	instr.....instrument, -al
Ga.....Gallium	int... ..interest
Ga.....Georgia	intens.....intensive
Gael.....Gaelic	interj. or
Gal .....Galatians	int.....interjection
gal.....gallon	interrog...interrogative      pro-
galv.....galvanism, galvanic	noun
gard.....gardening	intr. or
gen.....gender	intrans...intransitive
Gen.....General	Io... ..Iowa
Gen .....Genesis	Ir..... ..Iridium
gen.....genitive	Ir.....Irish
Geno.....Genoese	Iran.....Iranian
geog .....geography	irr .....irregular, -ly
geol.....geology	Is.....Isaiah
geom.....geometry	It.....Italian
Ger.....German, Germany	Jan.....January
Goth.....Gothic	Jap.....Japanese
Gov.....Governor	Jas.....James
govt.....government	Jer.....Jeremiah
Gr .....Grand, Great	Jn.....John
Gr .....Greek	Josh.....Joshua
gr.....grain, grains	Jr.....Junior
gram .....grammar	Judg .....Judges
Gr. Brit....Great Britain	K.....Potassium [ <i>Kalium</i> ]
Gris.....Grisons	K.....Kings [in Bible]
gun .....gunnery	K.....king
H.....Hegira	Kan.....Kansas
H.....Hydrogen	Kt.....Knight
h.....hour, hours	Ky.....Kentucky
Hab.....Habakkuk	L.....Latin
Hag.....Haggai	L.....Lithium
H. B. M....His [or Her] Britan-	l. [l. s. d.],      } pound,      pounds
nic Majesty	or £..... } [sterling]
Heb.....Hebrew, Hebrews	La.....Lanthanum
her.....heraldry	La.....Louisiana
herpet.....herpetology	Lam.....Lamentations
Hg.....Mercury [ <i>Hydrar-</i>	Lang.....Languedoc
<i>gyrum</i> ]	lang... ..language
hhd.....hogshead, hogsheads	Lap.....Lapland
Hind.....Hindustani, Hindu,	lat .....latitude
or Hindi	lb.; llb. or } pound; pounds
hist .....history, historical	lbs..... } [weight]
Hon .....Honorable	Let.....Lettish
hort.....horticulture	Lev. ....Leviticus
Hos .....Hosea	LG.....Low German
Hung.....Hungarian	L.H.D.....Doctor of Polite Lit-
Hydros.....Hydrostatics	erature
I.....Iodine	Lieut.....Lieutenant
I.; Is.....Island; Islands	Lim .....Limousin
Icel.....Icelandic	Lin .....Linnæus, Linnæan
ichth.....ichthyology	lit .....literal, -ly
Ida.....Idaho	lit .....literature
i.e.....that is [ <i>id est</i> ]	Lith.....Lithuanian
Ill.....Illinois	lithog.....lithograph, -y
illus.....illustration	LL.....Late Latin, Low
impera or	Latin
impr.....imperative	LL.D.....Doctor of Laws
impers.....impersonal	long.....longitude
impf or imp.imperfect	Luth.....Lutheran
impf. p. or	M.....Middle
imp .....imperfect participle	M.....Monsieur
improp.....improperly	m.....mile, miles
In.....Indium	m. or masc.masculine
in... ..inch, inches	M.A.....Master of Arts
incept.....inceptive	Macc. ....Maccabees
Ind .....India, Indian	mach... ..machinery
Ind .....Indiana	Mag.....Magazine

# ABBREVIATIONS.

Maj.....Major  
 Mal.....Malachi  
 Mal.....Malay, Malayan  
 manuf.....manufacturing,  
                   manufacturers  
 Mar.....March  
 masc or m.....masculine  
 Mass.....Massachusetts  
 math.....mathematics, math-  
                   ematical  
 Matt.....Matthew  
 M.D.....Doctor of Medicine  
 MD.....Middle Dutch  
 Md.....Maryland  
 ME.....Middle English, or  
                   Old English  
 Me.....Maine  
 mech.....mechanics, mechan-  
                   ical  
 med.....medicine, medical  
 mem.....member  
 mensur.....mensuration  
 Messrs. or  
     MM.....Gentlemen, Sirs  
 metal.....metallurgy  
 metaph.....metaphysics, meta-  
                   physical  
 meteor.....meteorology  
 Meth.....Methodist  
 Mex.....Mexican  
 Mg.....Magnesium  
 M.Gr.....Middle Greek  
 MHG.....Middle High Ger-  
                   man  
 Mic.....Micah  
 Mich.....Michigan  
 mid.....middle [voice]  
 Milan.....Milanese  
 mid. L. or { Middle Latin, Me-  
     ML.....{ diæval Latin  
 milit. or  
     mil.... military [affairs]  
 min.....minute, minutes  
 mineral.....mineralogy  
 Minn.....Minnesota  
 Min. Plen. Minister Plenipoten-  
                   tiary  
 Miss.....Mississippi  
 ML. or { Middle Latin, Me-  
     mid. L...{ diæval Latin  
 MLG.....Middle Low German.  
 Mlle.....Mademoiselle  
 Mme.....Madam  
 Mn.....Manganese  
 Mo.....Missouri  
 Mo.....Molybdenum  
 mod.....modern  
 Mont.....Montana  
 Mr.....Master [Mister]  
 Mrs.....Mistress [Missis]  
 MS.; MSS..manuscript; manu-  
                   scripts  
 Mt.....Mount, mountain  
 mus.....music  
 MUS.DOC...Doctor of Music  
 myth.....mythology, mytho-  
                   logical  
 N.....Nitrogen  
 N. or n.....North, -ern, -ward  
 n.....noun  
 n or neut...neuter  
 Na.....Sodium [*Natrium*]  
 Nah.....Nahum

N. A., or  
     N. Amer. North America, -n  
 nat.....natural  
 naut.....nautical  
 nav.....navigation, naval af-  
                   fairs  
 Nb.....Niobium  
 N. C. or  
     N. Car... North Carolina  
 N. D.....North Dakota  
 Neb.....Nebraska  
 neg.....negative  
 Neh.....Nehemiah  
 N. Eng.....New England  
 neut or n...neuter  
 Nev.....Nevada  
 N.Gr.....New Greek, Modern  
                   Greek  
 N. H.....New Hampshire  
 NHG.....New High German  
                   [German]  
 Ni.....Nickel  
 N. J.....New Jersey  
 NL.....New Latin, Modern  
                   Latin  
 N. Mex.....New Mexico  
 N. T. or  
     N. Test... New Testament  
 N. Y.....New York [State]  
 nom.....nominative  
 Norm. F...Norman French  
 North. E...Northern English  
 Norw... Norwegian, Norse  
 Nov.....November  
 Num.....Numbers  
 numis.....numismatics  
 O.....Ohio  
 O.....Old  
 O.....Oxygen  
 Obad.....Obadiah  
 obj.....objective  
 obs. or †...obsolete  
 obsoles.....obsolescent  
 O.Bulg.....Old Bulgarian or Old  
                   Slavic  
 Oct.....October  
 Odontog...odontology  
 OE.....Old English  
 OF or  
     O. Fr.... Old French  
 OHG.....Old High German  
 Ont.....Ontario  
 opt.....optics, optical  
 Or.....Oregon  
 ord.....order  
 ord.... ordnance  
 org.....organic  
 orig.....original, -ly  
 ornith.....ornithology  
 Os.....Osmium  
 OS.....Old Saxon  
 O. T., or  
     O. Test... Old Testament  
 Oxf.....Oxford  
 oz.....ounce, ounces  
 P.....Phosphorus  
 p.; pp.....page; pages  
 p., or part. partiple  
 Pa. or Penn. Pennsylvania  
 paint.....painting  
 palæon.....palæontology  
 parl.....parliament  
 pass.....passive



# ABBREVIATIONS.

pathol or path.....pathology  
 Pb.....Lead [*Plumbum*]  
 Pd.....Palladium  
 Penn or Pa. Pennsylvania  
 perf.....perfect  
 perh.....perhaps  
 Pers.....Persian, Persic  
 pers.....person  
 persp.....perspective  
 pert.....pertaining [to]  
 Pet.....Peter  
 Pg. or Port. Portuguese  
 phar.....pharmacy  
 PH.D.....Doctor of Philosophy  
 Phen.....Phenician  
 Phil.....Philippians  
 Philem.....Philemon  
 philol.....philology, philological  
 philos. { philosophy, philo-  
 or phil... } sophical  
 phonog.....phonography  
 photog.....photography  
 phren.....phrenology  
 phys.....physics, physical  
 physiol.....physiology, physiological  
 Pied.....Piedmontese  
 Pl.....Plate  
 pl. or plu...plural  
 Pl. D.....Platt Deutsch  
 plupf.....pluperfect  
 P.M.....afternoon [*post meridiem*]  
 pneum.....pneumatics  
 P. O.....Post-office  
 poet.....poetical  
 Pol.....Polish  
 pol. econ...political economy  
 polit.....politics, political  
 pop... ..population  
 Port. or Pg. Portuguese  
 poss.....possessive  
 pp.....pages  
 pp.....past participle, perfect participle  
 p. pr.....present participle  
 Pr. or Prov. Provencal  
 pref.....prefix  
 prep.....preposition  
 Pres.....President  
 pres.....present  
 Presb.....Presbyterian  
 pret.....preterit  
 prim.....primitive  
 priv.....privative  
 prob.....probably, probable  
 Prof.....Professor  
 pron.....pronoun  
 pron.....pronunciation, pronounced  
 prop.....properly  
 pros.....prosody  
 Prot.....Protestant  
 Prov. or Pr. Provencal  
 Prov.....Proverbs  
 prov.....province, provincial  
 Prov. Eng. Provincial English  
 Prus.....Prussia, -n  
 Ps.....Psalm, Psalms  
 psychol.....psychology

pt.....past tense  
 pt.....pint  
 Pt.....Platinum  
 pub.....published, publisher, publication  
 pwt.....pennyweight  
 Q.....Quebec  
 qt.....quart  
 qtr.....quarter [weight]  
 qu.....query  
 q.v.....which see [*quod vide*]  
 R.....Rhodium  
 R.....River  
 Rb.....Rubidium  
 R. Cath....Roman Catholic  
 rec. sec....recording secretary  
 Ref.....Reformed  
 refl.....reflex  
 reg.....regular, -ly  
 regt.....regiment  
 rel. pro. or rel.....relative pronoun  
 repr.....representing  
 repub.....republican  
 Rev.....Revelation  
 Rev.....The Reverend  
 Rev. V.....Revised Version  
 rhet.....rhetoric, -al  
 R. I.....Rhode Island  
 R. N.....Royal Navy  
 Rom.....Roman, Romans  
 Rom.....Romanic or Romance  
 Rom. Cath. { Roman Catholic  
 Ch. or R. } Church  
 C. Ch....  
 r.r.....railroad  
 Rt. Rev...Right Reverend  
 Ru.....Ruthenium  
 Russ.....Russian  
 r.w.....railway  
 S.....Saxon  
 S.....Sulphur  
 s.....second, seconds  
 s. [l. s. d.]..shilling, shillings  
 S. or s.....South, -ern, -ward  
 S. A. or S. Amer..South America, -n  
 Sam.....Samaritan  
 Sam.....Samuel  
 Sans, or Skr.....Sanskrit  
 Sb.....Antimony [*Stibium*]  
 s.c.....understand, supply, namely [*scilicet*]  
 S. C. or S. Car...South Carolina  
 Scand.....Scandinavian  
 Scot.....Scotland, Scotch  
 scr.....scruple, scruples  
 Scrip.....Scripture [s], Scriptural  
 sculp.....sculpture  
 S. D.....South Dakota  
 Se.....Selenium  
 sec.... ..secretary  
 sec.....section  
 Sem.....Semitic  
 Sep.....September  
 Serv.....Servian  
 Shaks.....Shakespeare  
 Si.....Silicon

# ABBREVIATIONS.

Sic.....	Sicilian	trigon.....	trigonometry
sing.....	singular	Turk.....	Turkish
sis.....	sister	typog.....	typography, typographical
Skr. or		U.....	Uranium
Sans.....	Sanskrit	ult.....	ultimate, -ly
Slav.....	Slavonic, Slavic	Unit.....	Unitarian
Sn.....	Tin [ <i>Stannum</i> ]	Univ.....	Universalist
Soc.....	Society	Univ.....	University
Song Sol...	Song of Solomon	U. Presb...	United Presbyterian
Sp.....	Spanish	U. S....	United States
sp. gr.....	specific gravity	U. S. A....	United States Army
sq.....	square	U. S. N....	United States Navy
Sr.....	Senior	Ut.....	Utah
Sr.....	Strontium	V.....	Vanadium
....	Saint	v.....	verb
....	street	Va.....	Virginia
stat.....	statute	var.....	variant [word]
s.T.D.....	Doctor of Sacred Theology	var.....	variety of [species]
subj.....	subjunctive	Ven.....	Venerable
suf.....	suffix	Venet.....	Venetian
Su. Goth...	Suo-Gothic	vet....	veterinary
superl.....	superlative	v. i. or	
Supp.....	Supplement	v. intr....	verb intransitive
Supt.....	Superintendent	vil.....	village
surg.....	surgery, surgical	viz.....	namely, to-wit [ <i>vide-licet</i> ]
Surv.....	surveying	v. n.....	verb neuter
Sw.....	Swedish	voc.....	vocative
Swab.....	Swabian	vol.....	volume
sym.....	symbol	vols.....	volunteers
syn.....	synonym, -y	Vt.....	Vermont
Syr.....	Syriac, Syrian	v. tr.....	verb transitive
t.....	town	W.....	Tungsten [ <i>Wolfram</i> ]
Ta....	Tantalum	W....	Welsh
Tart.....	Tartar	W. or w....	West, -ern, -ward
Te.....	Tellurium	Wal.....	Walachian
technol....	technology	Wall.....	Walloon
teleg.....	telegraphy	Wash.....	Washington
Tenn.....	Tennessee	Westph....	Westphalia, -n
term.....	termination	W. Ind. ....	West Indies, West
terr.....	territory	or W. I....	Indian
Teut.....	Teutonic	Wis.....	Wisconsin
Tex.....	Texas	wt.....	weight
Th.....	Thorium	W. Va.....	West Virginia
theat:.....	theatrical	Wyo.....	Wyoming
theol.....	theology, theological	Y.....	Yttrium
therap.....	therapeutics	yd.....	yard
Thess.....	Thessalonians	yr.....	year
Ti.....	Titanium	Zech.....	Zechariah
Tim.....	Timothy	Zeph.....	Zephaniah
Tit.....	Titus	Zn.....	Zinc
Tl.....	Thallium	zool.....	zoology, zoological
toxicol....	toxicology	Zr.....	Zirconium
tp.....	township		
tr. or trans.	transitive		
transl.....	translation, trans. lated		

See also ABBREVIATIONS: in Vol. I

# THE IMPERIAL CYCLOPEDIA AND DICTIONARY.

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DOMINIS, *dom'e-nēs*, MARCUS ANTONIUS DE: 1566-1624, Sep.; b. Arba, on the coast of Dalmatia: ecclesiastic, whose career was singular and checkered. He was educated, first at Loretto, then at Padua, where he greatly distinguished himself by his ability and varied studies. While at Padua, he taught mathematics, physics, and eloquence. Having completed his theological curriculum, he was, after some time, appointed bp. of Segni, and two years later, abp. of Spalatro, in which capacity, however, he quarrelled with the pope, and having, moreover, exhibited certain Prot. leanings, he found it expedient to resign his post. In 1616, he came to England, where he was hospitably received. King James appointed him Dean of Windsor; and while holding this office, he wrote his *De Republica Ecclesiastica*, a work in which he endeavored to show that the pope had no supremacy over other bishops, but was only *primus inter pares*. D. published one or two other productions 1617-18; but finding Anglicanism far from satisfactory, a revulsion of feeling occurred, and D. once more looked and longed for the unity of the church catholic. The motives that induced his reversion to the Church of Rome are not known. Most writers consider that he was actuated by avarice and ambition, but a critical appreciation of his character makes doubtful this harsh judgment. He was, it has been supposed, desirous of discovering a church broad enough to form the basis of a universal Christianity. Men holding such opinions are always misunderstood, and so D., even after his return to Rome, was still suspected of heresy. In consequence, he was imprisoned in the castle of St. Angelo, where he died. Being subsequently condemned as a heretic, his body was raised from its grave, and burned.

While at Padua, D. wrote his *De Radiis Visus et Lucis in Vitris Perspectivis et Iride* (Venice, 1611). He was the first to point out that in the phenomenon of the rainbow, the light undergoes, in each rain-drop, two refractions and an intermediate reflection.



## DOMINIUM—DOMITIANUS.

**DOMINIUM**, *dō-mĭn'ĭ-ŭm*: Roman law-term, equivalent to real ownership; a full legal right in and to an object, as the right from which alone legal possession could flow, but which possession alone could never confer. The right to possess is thus distinguished from the right arising from possession, which is the usufruct. D., or ownership, may be absolute and include the beneficial interest in the subject, or it may consist in a limited power over it at the time, or some ultimate right to it at a future time. D. has a totally different meaning from Imperium (q.v.).

**DOMINO**, n. *dōm'ĭ-nō* [F. *domino*—from Sp. *domino*, a black hood worn by priests, originally by a master—from L. *domĭnus*, a master]; outer mantle or cloak with wide sleeves and a movable hood, used at masquerades (see MASQUERADE); formerly the name was given to the outer garb of priests officiating in winter in cold edifices. **Dom'INO**, n. *-ĭ-nō*, **DOM'INOES**, n. plu. *-nōz*, game usually played with 28 oblong, flat tablets of ivory or bone, etc., each of which bears two numbers marked by points from nought to six. The tablets, backed with black, have, so far, a resemblance to a domino. The party wins who has first played out his tablets, or, if this has been found impossible, who has the fewest points on the tablets still remaining. Attempts have been made to trace the game back to the Greeks and Hebrews, and to the Chinese. It is certain, that it was introduced about the beginning of the 18th c. from Italy into France, where it immediately became popular in the larger towns. From Paris it spread to Germany, where, as in France, it is now played in every coffee-house. The Café de l'Opera, in Paris, long boasted of assembling the most expert players; an honor warmly contested by the establishments of Rouen and Poitiers.

**DOMINUS**, *dōm'ĭ-nŭs*: Latin word which we commonly render lord, but which more properly signifies master, as opposed to slave (*servus*). Aurelianus is said to have been the first emperor who adopted dominus as a title of honor on his medals, though it had long been made use of in conversation and in correspondence in that sense, as by Pliny in addressing Trajan. In legal phraseology, the *dominus litis* is the person really interested in the issue of an action, though not necessarily the pursuer.

**DOMITE**, n. *dō'mĭt*: a granular arenaceous-looking variety of trachyte found in the Puy-de-Dôme, France.

**DOMITIANUS**, *dō-mĭsh-ĭ-ā'nŭs*, T. FLAVIUS, Emperor of Rome: died A.D. 96, Sep. 18 (reigned 81–96): son of Vespasian, and younger brother of Titus, whom he succeeded on the throne. The earlier years of his reign were on the whole advantageous to the public. Many good laws were passed, the provinces carefully governed, and justice was rigidly administered. As he grew older, however, his ambition, his jealousy, and his pride, wounded by the failure of his campaigns against the Dacians and the Marcomanni in 87, began to instigate him to the most atrocious cruelties. By murder or banishment, he deprived Rome of nearly every citizen conspicuous for talent, learning, or

wealth. To win the army, he greatly increased the pay of the soldiers, and secured the favor of the people by prodigal largesses and gladiatorial shows and games, in which he sometimes took part in person. His cruelties became at length so intolerable, that a conspiracy—encouraged, if not organized—by his wife Domitia, whom he had doomed to death, was formed against him, and the tyrant fell under the dagger of the assassin.

DOMO D'OSSOLA, *dō'mō dō'ssō-lā*: charming little town in the extreme north of Piedmont, at the foot of the Simplon, near the right bank of the Tosa, which flows into Lago Maggiore. Its general aspect is peculiarly Italian. It has some trade and several handsome buildings, but is noteworthy chiefly as a starting-point for tourists who wish to make excursions up the southern valleys of the Alps. The chief places of interest in the vicinity are the Val Anzasca, the Val Vigizzo, and the Falls of the Tosa. From D. D. the Simplon can be ascended in seven hours. Pop. 2,480.

DON, n. *dōn* [Sp. *don*; Port. *dom*—from L. *dominus*, a lord]: a Spanish title of nobility, now a title of respect of general application (see DOM). DON'NA, n. fem. of DON, title of a lady in Spain and Portugal. DONS, in *familiar language*, the heads of colleges, and the fellows at the universities. PRIMA DONNA, *prī'mă dōn'nă* [L. *primus*, first]: the chief singer in an opera.

DON, v. *dōn* [contr. for *do on*]: to put on; to assume; opposite of *doff*. DON'NING, imp. DONNED, pp. *dōnd*.

DON, *dōn*, or DUN: river of the W. Riding of Yorkshire, England, rising in the moors on the borders of Derbyshire and Cheshire. It runs 55 m., first s.e. to Sheffield, and then n.e. by Rotherham, Doncaster, and Thorne, into the Aire, which soon afterward unites with the Ouse. Its basin consists of Carboniferous and Permian strata. Its chief tributaries are the Rother, Dearne, and Went. It is navigable for the last 39 m. of its course below Sheffield, by the aid of artificial canals and cuts.

DON (anc. *Ta'nais*): river of Russia, having its source in a small lake in the govt. of Tula, lat. about 53° 45' n., and long. 38° 10' e. It flows at first s.e. through the governments of Tula, Riazan, Tambov, and Woronetz, and after winding s.w. through the country of the Don Cossacks, it advances to its embouchure in the Sea of Azov, which it enters by three mouths, only one of which is navigable. The Don receives 80 affluents, of which the principal are the Sosna and the Donetz on the right, and on the left the Khoper, the Medvieditza, the Sal, and the Manitch. Its total length is about 1,150 m. Its course is obstructed by frequent sand-banks, which, when the water is low, render navigation impossible to any but flat-bottomed boats. From April to June, however, during which months it overflows its banks, and forms unwholesome swamps on either side, it is navigable as far up as Zadonsk, 600 m. The Don is connected by a canal with the Volga, and by this means the produce and manufactures of the



## DON—DONALDSON.

interior are conveyed to the southern provinces of Russia. The waters of the Don abound in fish, the traffic in which commodity is considerable, especially in its lower course.

**DON:** river of Aberdeenshire, Scotland, rising on the w. border of the county in a peat-moss, 1,640 ft. above the sea. It runs n.e., then e., and lastly s.e., entering the sea a mile n.e. of Old Aberdeen. It has a total course of 78 m., but only 42 in a straight line, and it drains a tract of 495 sq. m., chiefly of granite and gneiss, with a little syenite and clay-slate. Its chief tributary is the Ury. Near the junction of the Ury and Don is a curious conical gravel hillock, called the Bass, the subject of a prophecy by Thomas the Rhymer. The Don, at less than a mile from the sea, is crossed by the old 'Brig o' Balgownie,' of one Gothic arch. Lord Byron, while a youth, had a superstitious dread in crossing this bridge, from an old prophecy connected with it. To keep this bridge in repair, Sir Alexander Hay, 1605, left an annuity of £2, 5s. 8 $\frac{2}{3}$ d., which sum has now accumulated to about £25,000, in addition to about £17,000 spent in 1825, in the erection of a new bridge over the Don, a quarter of a mile lower down.

**DONA, SAN, *sán dō'na*:** town of n. Italy, province of Venice, 18 m. n.e. from Venice, on the left bank of the Piave. Pop. 5,550.

**DONABUE, *dōn-a-bū'*:** town of Pegu, on one of the main branches by which the Irawaddy enters the Bay of Bengal; lat. 17° 10' n., and long. 95° 27' e. It is within the delta of this grand artery of the country, and is situated 65 m. n.w. of Rangoon, and 54 n.e. of Bassein, the principal seaports of the newly acquired British province. It is only on historical grounds, however, that the place is worthy of notice. Here the English were repulsed with considerable loss in both the Burmese wars, in 1825, and 1853.

**DONAGHADEE, *dōn-a-chá-dē'* or *dōn-a-ga-dē'*:** seaport in the n. of county Down, on the Irish Channel, 18 m. English (14 Irish) e.n.e. of Belfast. Its exports are cattle, grain, potatoes, etc. It is famous for muslin embroidery, which gives employment to most of its women. Pop. (1891) 1,886.

**DONALD, E. WINCHESTER, D.D.:** Protestant Episc. clergyman: b. Andover, Mass., about 1854. After graduating at Amherst Coll. he studied at the General Theol. Seminary, New York, was ordained, and became rector of the Church of the Intercession in the upper part of New York. After a few years in this charge he was called to succeed Dr. John Cotton Smith as rector of the Church of the Ascension, New York. In 1892, on the election of Dr. Phillips Brooks to be bishop of Mass., Dr. D. was chosen as his successor in the rectorship of Trinity Church, Boston. His preaching shows clear thought, strong conviction, and broad sympathy.

**DONALDSON, *dōn'ald-son*, JAMES LOWRY:** 1814. Mar. 17—1885. Nov. 4; b. Baltimore: soldier. He graduated at the U. S. Milit. Acad. 1836; served through the Seminole war in Fla. as 2d lieut, 3d artil.; was assigned to

## DONALDSON.

1st artil. 1837; and promoted 1st. lieut. 1838. After a period of garrison service, he was ordered to Fort Brown, Tex., 1846, thence to Mexico, where he won brevets of capt. and maj. for gallantry at Monterey and Buena Vista, and was appointed assist. quartermaster and promoted to be full capt. 1847, Mar. He was chief quartermaster of the dept. of N. Mex., 1858-62, of the milit. div. of the Tennessee, 1865, and thence of the milit. div. of the Missouri till 1869; became col. on the regular staff and brev.-maj. gen. of vols.; was retired 1869; and resigned from the army 1874, Jan. 1. He is credited with having suggested the creation of national soldiers' cemeteries and the annual ceremony of decoration.

DONALDSON, *dōn'ald-son*, JOHN WILLIAM: 1811, June 10--1861, Feb. 10; b. London; descendant of an old Scotch family. He was educated first at the Univ. of London, afterward at Trinity College, Cambridge. He graduated B.A. 1834, and the year following, he was elected Fellow. His first work was *The Theatre of the Greeks*, partly original and partly compiled, which, revised in six successive editions, still holds its place as a school and college class-book. He was assistant-tutor of Trinity, Cambridge, when he published the first edition of his *New Cratylus* (1839), remarkable for its research and boldness, and as the first attempt, on a large scale, to familiarize Englishmen with the principles of comparative philology, as established by the great scholars of Germany--with special application to the Greek language. The *New Cratylus*, in its latest, largest, and most improved form, is still the most important work in English on the subject. Mr. D. soon afterward married, and accepted the post of head-master of the grammar-school of Bury St. Edmunds, having previously taken holy orders. He extended his linguistic studies to Hebrew and Arabic, and most of the dialects of modern Europe. In the *Varronianus* (first ed. 1844), he undertook for Latin philology what in the *New Cratylus* he had done for Greek. Among his other works of this period were an edition of Pindar, or the *Antigone* of Sophocles (with a verse translation), *Maskil le Sopher* (a treatise on Hebrew grammar), and finally *Jashar*, a book written in Latin, and published at Berlin, the object of which was, by critical tests, to distinguish the fragments of the lost book of *Jashar* imbedded in the Pentateuch. This book was violently assailed by the so-called 'religious press,' which did not prevent its undaunted author from issuing a second edition.

Soon afterward he resigned his place at Bury St. Edmunds, and returned to Cambridge, where he gave a course of lectures on Latin Synonyms, and occupied himself with tuition. Here he wrote a volume entitled *Christian Orthodoxy*. Some critics vehemently disputed its right to the title. A smaller volume on Classical Scholarship followed. He had previously issued a *Greek Grammar* and a *Latin Grammar* for schools, which he rewrote at Cambridge. In 1856, he was appointed one of the classical examiners in the Univ. of London.

Dr. D. was engaged in the compilation of a new *Greek*



## DONALDSON'S HOSPITAL—DONATELLO.

*Lexicon*, when his health began to fail. Incipient disease of the brain, the result of overwork, showed itself first by neuralgic pains, afterward by more alarming symptoms. He removed to London, and died in his mother's house. In private life, he was distinguished by kindness of heart, ready wit, and unfailing vivacity. A little work, published anonymously under the title of *Phileleutherus Anglicanus*, which made no small sensation, has been generally attributed to him.

**DONALDSON'S HOSPITAL:** extensive establishment at Edinburgh, of the character of Christ's Hospital, London. Its founder was James Donaldson, printer in Edinburgh, son of Alexander Donaldson, publisher (see **BOOK-TRADE: COPYRIGHT**). In 1763, Alexander started the *Edinburgh Advertiser* newspaper, afterward conducted by his son James. Dying in 1830, James bequeathed the estate of two generations, amounting to about £215,000, to trustees, for the endowment and erection of a hospital for the maintenance and education of poor boys and girls. The building, which occupies a commanding situation w. of Edinburgh, was begun 1842, and finished 1850: it is a large and beautiful quadrangular structure, in the Elizabethan style. The cost of the edifice and furnishings was nearly £124,000, but as this was defrayed by the accumulated interest, the original endowment remained untouched. The hospital can accommodate 300 children—150 boys and 150 girls: in 1884 it contained 216 children (114 boys and 102 girls), of whom 119 (56 boys and 63 girls) were deaf and dumb. Those eligible for admission are declared to be, '1st; Poor children of the name of Donaldson or Marshall, if appearing to the governors to be deserving; 2d, Such poor children as shall appear to be in the most destitute circumstances and the most deserving of admission.' None are received whose parents are able to maintain them. The children are clothed and maintained in the hospital, and taught such useful branches of a plain English education as will fit the boys for trades, and the girls for being servants. The age of admission is from seven till nine years, and that of leaving the hospital fourteen years. The children wear a simple uniform of modern fashion.

**DONATELLO**, *do-nâ-těl'o* (properly, **DONATO DI BETTO BARDI**): one of the restorers of the art of sculpture in Italy: 1383–1466 Dec. 13; b. Florence. He belonged to the Donato family, which reckons several scholars among its members, and gave some doges to the republic of Venice. *Donatello* was a diminutive given to the artist in childhood. He received his earliest instructions from Lorenzo Bicci. His first great works in marble were the *St. Peter* and *St. Mark* in the church of St. Michael in his native city. His own favorite, however, was the statue of an old man in the garb of a senator, on the steeple of the same church. It is known under the name of *Zuccone* (the Gourd or Baldhead). D. died at Florence. D.'s principal works, besides those mentioned, are—a statue of *St. George* (in marble). *Judith bearing the Head of Holo-*

## • DONATI—DONATION.

*fernes* (in bronze), the *Crucifixion* (in wood), several statues of the *Baptist* (in various materials), and a grand equestrian statue (in bronze) of Erasmus Gattamelata, on one of the public places of Padua. He also executed a number of bas-reliefs. The whole tendency of D.'s genius was toward a reproduction of the antique; and his style, though not free from harshness and the rudeness of early art, sometimes reminds one of the glorious productions of ancient Greece.

DONATI, *do-nâ'tē*, GIOVANNI BATTISTA: 1826, Dec. 16–1873, Sep. 20; b. Pisa, Italy: astronomer. He was appointed assist. in the observatory of Florence 1852, and succeeded Prof. Arni as director 1864, and became prof. of astronomy in the Royal Institution of Florence. The royal observatory on the hill of Arcetri, near Florence, memorable as the site of Galileo's tower, was erected under his superintendence, and directed by him. He made discovery of comets 1855, June 3, 1857, Nov. 10, 1858, June 2, and 1864, Sep. 9, and numerous spectroscopic observations of comets and the solar disk, and published diagrams of several lines in the spectra of 15 stars 1862. His chief distinction lies in the discovery of the splendid 1858 comet, which now bears his name. It was visible many months, and came nearest to the earth in Oct., when its tail was remarkably brilliant and estimated to be over 40° in length. A combination of all the observations that were made on its position, assigned it to a period of about 1,950 years.

DONATION, n. *dō-nā'shŭn* [F. *donation*—from L. *donā-tiōnem*, a donation—from *dōnō*, I give; *donātus*, given]: the act of giving; a grant or gift; that which is given or bestowed. DONATIVE, a. *dŏn'ā-tiv*, vested or vesting by donation: N. a gift; a gratuity; in *Eng. law*, a benefice merely given by the patron to a clergyman without presentation, institution, or induction. DONEE, n. *dō-nē'*, the person to whom a gift is made. DONOR, n. *dō'nēr* [F. *donneur*]: one who gives a gift; a benefactor. DONATION PARTY, n. a party assembling at the house of a person, as of the parish clergyman, each bringing a present.—SYN. of 'donation': benefaction; grant; gift; present.

DONA'TION, in Law: grant or gratuity, a transfer of property without any transfer in requital. A D. in prospect of death, *donatio mortis causa*, differs from a gift *inter vivos*, inasmuch as it is incomplete, and revocable during the donor's life, or ambulatory, as lawyers say. It differs from a legacy, on the other hand, in that it requires no probate, for it is not a testamentary act, the donee's title proceeding directly from the donor in his lifetime. In Roman (followed by Scottish) law there was distinction between donations *pure*—or those not in anticipation of death, marriage, or any other specific event—and gifts. Such donations are in reality gifts, but gifts not intended to be immediately delivered. It was with reference to this species of D. that the equitable arrangement called the *beneficium competentiæ* was introduced, by which the donor was allowed to retain as much as was necessary for his own



## DONATIST.

subsistence before fulfilling the obligation, if he was reduced to indigence. Another implied condition of a D. by the Roman law was, that when any one who had no children made a D. of the whole or the greater part of his estate, the D. became void if he had children afterward; the presumption being, that he would not have given his property away if he had anticipated that he was to become the father of a family. It is a general principle of law, that a D. is never presumed; but this rule suffers an exception in the case of aliment given without an agreement to pay board, which is presumed to be gratuitous unless given by one who makes a livelihood of entertaining strangers. Minors, and persons incapable of contracting, are not presumed to have been alimented gratuitously, unless their relationship to their entertainer be such as to warrant the presumption. Where the minor is possessed of an adequate separate estate, even the father may claim the expense of maintaining him, and the rule applies with greater force to all more distant relatives. Donations between man and wife (*inter virum et uxorem*) were by the Roman law, and are by the law of Scotland, revocable by the donor at any time during his or her life, *ne conjuges mutuo amore se spolient* (lest the spouses should despoil themselves from mutual love). But mutual grants for substantial considerations between the spouses are not revocable, if there be any reasonable proportion between the two. Thus, where there has been no ante-nuptial contract of marriage, the husband may provide for the wife in the event of her survivance, and the provision will be effectual so far as it is rational. It will be revocable only *quoad excessum*. Donations in the prospect of marriage (*donationes propter nuptias*) in the Roman law were given by the husband in security of the dowry or *dos*, which he was bound to pay back to the wife or her relatives on the dissolution of the marriage. When the *dos* was returned to the wife, the donation was returned to the husband.

In the United States, a D. in expectation of the giver's death must be something more than an evidence of intention to give, such as a check drawn but not transferred. Donations of personal property between husband and wife, not made for defrauding creditors, are valid; and donations of real estate may be held good in equity, though usually not at law; the intervention of a third person will give validity. Gifts of property before an intended marriage, by the prospective husband to the prospective wife, are valid even as against creditors, but will be subjected to strict scrutiny for evidence of good faith. Indeed, generally in a D. the evidence of good faith must be clear.

DONATIST, n. *dō'nă-tist* [from *Donātus*, their leader]: follower of Donatus, a Numidian bishop who opposed the election of Cecilianus in 311 to the bishopric of Carthage, on the ground of the ordination having been performed by one who had been a Traditor, or traitor—that is, one who, during persecution, had given up the sacred books to the pagan authorities: and also because Cecilianus had exhibited great hostility toward the victims of the late persecu-

## DONATUS.

tion. There were indeed two Donatuses connected with this sect, Donatus, Bp. of Casæ Nigræ, and Donatus surnamed Magnus, who succeeded Majorinus as Bp. of Carthage, 315,—the latter the most influential leader. After some time, the Council of Arles, 314, Aug. 1, decided against Donatus, who in a short time seceded from the Catholic Church, and formed a distinct sect, which, by 330, had 172 bishops in n. Africa. The Donatists, like the followers of Novatian (q.v.), went upon the principle, that the essence of the true church consisted in the purity and holiness of all its members individually, as well as in its apostolical and Catholic foundation and doctrine. They therefore both excommunicated all lapsed and gross offenders, not receiving them again but on being re-baptized, and also held that the efficacy of the sacraments depended on the worthiness of the administrator. Driven to fanaticism by the oppression of the secular power, they not only denied to the state all right to meddle with ecclesiastical affairs, but bands of Donatist ascetics collected, attacked the imperial troops (348), and continued to devastate Mauritania and Numidia for a dozen years. In the beginning of the 3th c., they seem to have almost equalled the Catholics in number, and the eloquence of Augustine and the severities of Honorius were exercised upon the sect in vain; they continued to exist as a separate body. But by adopting a more prudent plan of proceeding, the Catholic bishops had, by the end of the 6th c., induced most of those that had left to return to the bosom of the church; and in the 7th c. the Donatists were extinct. *Donatism*, the system of this sect, regarded by Neander (see *Dogmengeschichte*, translated into English by J. E. Ryland: Bohn, II. 394) as a reaction against that form Catholicism, ‘which conceived the church to be an outward organism, continued by the succession of bishops, who formed the necessary medium of communication with Christ, and for partaking in the Holy Spirit and salvation.’ ‘Whoever is shown to be a Christian in a right and lawful manner, is to me a Catholic,’ was a saying of the Donatists; while the church in general, guided by Augustine, wished to let the worthy and unworthy remain mixed together, and to defer the separation to the final judgment.’ The Donatists have been called the Puritans of their day, but this comparison is somewhat forced. Their ideal of the church was certainly higher than that of their opponents, and may be deemed more scriptural; though both its scripturalness and its practical character are stoutly denied in great sections of the church. That the Donatists were mostly fanatical in the extremes to which they pressed the application of their principles, is undeniable. Their revolt introduced great social excesses.

DONATUS, *dō-nā'tūs*, ÆLIUS: well-known grammarian and commentator, who taught grammar and rhetoric at Rome about 355, and was the instructor of St. Jerome. He wrote treatises, *De Literis*, *Syllabis*, *Pedibus et Tonis*, *De Octo Partibus Orationis*, and *De Barbarismo, Solecismo*, etc., the best edition of which is in Lindemann's *Corpus Gram-*



## DONAUWÖRTH—DON BENITO.

*maticorum Latinorum* (vol. i.). These writings form a full course of Latin grammar, and in the middle ages were the only text-book in the schools, so that Donat came, in the west of Europe, to be synonymous with grammar, or with the elements of any science. *The Donat into Religion* is the title of a book by an English bishop, and there was an old French proverb, *Les diables estoient encore à leur Donat* (The devils were yet in their grammar). The Latin grammar of D. has formed the groundwork of the elementary treatises on that subject to the present day. Donatus was one of the first books on which the art of printing by means of letters cut on wooden blocks was tried, and copies of these Donatuses are reckoned among the greatest bibliographical curiosities. The author also wrote a commentary on Terence, of which we possess only a part extending to five comedies, printed in the ed. of Terence by Klotz (2 vols., Leip. 1838).

From this D. must be distinguished a later grammarian, TIBERIUS CLAUDIUS DONATUS, from whom we have a worthless life of Virgil, prefixed to many editions of that poet, and fragments of a commentary on the *Æneid*.

DONAUWÖRTH, *dō'now-vört*: town of Bavaria, at the confluence of the Wernitz and the Danube, about 25 m. n.n.w. of Augsburg. It is well built in the form of an amphitheatre, round the side of a hill, and is surrounded by walls. It was formerly a free imperial city of considerable importance, but has now sunk into insignificance. It is historically interesting as the main cause of the Thirty Years' War; the severity of the punishment meted out to the inhabitants in 1607, in consequence of their adoption of the Reformed doctrines, and their assault on a Rom. Cath. procession of the 'host,' having led to the formation of the Prot. League, and Cath. Union, the opponents in that long and severe struggle. It is likewise associated with the name of Marlborough, who stormed and carried the intrenched camp of the Bavarians here 1704. Also, 1805, Oct. 6, the French, under Soult, obtained a victory here over the Austrians, under Mack. Pop. abt. 4,000.

DONAX, *dō'naks*: genus of lamellibranchiate mollusks, of the family *Tellinidæ*, with shell of two equal valves, which close perfectly, and are of triangular form, prettily striated from the beak to the margin, the beak occupying the obtuse angle of the triangle. The species of D. are generally small. The fossil species are not numerous, and belong to the eocene formation.

DONAX: see REED.

DON BENITO, *dōn bā-nē'tō*: town of Spain, province of Badajoz, 55 m. e. of the city of Badajoz. It is near the left bank of the Guadiana, and is in general well built, with wide and clean streets. It has several squares, the chief of which is lined with the principal structures in the town, including the town-hall, prison, and a convent; and in the centre is a public promenade. D. B. has manufactures of woollens, wine, and oil, and its proximity to the Guadiana affords it great trading facilities. Pop. abt. 15,000

## DON CARLOS—DONEGAL.

DON CAR'LOS: see CARLOS.

DONCASTER, *dŏng'kas-tér*: municipal borough in the W. Riding of Yorkshire, England, on the right bank of the Don, on the Great North Road, 35 m. s. of York. The country around is flat, but beautiful. Fine old elms line the broad and level road from the south. D. is very clean, and well built. Its High street is a mile long. It has manufactures of iron, brass, sacking, linen, and agricultural machines. Its corn-market is large and important. D. was the ancient *Danum*, and lay on the Roman road from York to Lincoln. Roman coins, urns, and a votive altar have been found here. It was the *Dona Castre* of the Saxons. The Saxon Northumbrian kings had a palace here. D. was burned by lightning 759, and frequently ravaged by the Danes. It has long been famous for its annual races, begun 1703, and held a mile s.e. of the town in the second week of September. Colonel St. Leger, 1776, founded stakes which have been yearly run for by the best horses in England. On an eminence five m. w.s.e. of D. are the ruins of Conisborough Castle, a Norman-Saxon round tower, 37 ft. in diameter and 86 ft. high, with walls 15 ft. thick, strengthened by square buttresses reaching the whole height. The door is arrived at by an external flight of 37 steps, and within is a cylinder open to the sky. Pop. (1871) 18,768; (1881) 21,130; (1891) 25,936.

DON COSSACK, *dŏn kŏs'sak*: govt. of Russia, bounded n. by the govt. of Saratov, s. by the Caucasus and Chernomorsk, e. by Astrakhan, w. by Voronezh and Yekaterinoslav; bet. lat. 46° 10' and 51° 10' n., long. 37° 10' and 44° 15' e.; 63,532 sq. m.; cap. Tagaurog. It consists of a vast plain, forms a part of the basin of the Don river, which traverses it, has a mild and pleasant climate in summer with great cold and severe storms in winter, possesses a soil of considerable fertility though poorly cultivated, and has extensive agricultural and cattle-raising interests. The people resemble Russians, but are not as stout in build, are spirited, brave, and great horsemen; their language combines the Russian, Polish, and Turkish; and their religion is that of the Greek Church. They live entirely by military rule, and their original tribal character has almost wholly disappeared under Russian sovereignty. Pop. (1867) 1,010,135; (1889) 1,896,113; (1897) 2,575,818.

DONDRA HEAD, *dŏn'drá hĕd*: most southerly extremity of Ceylon, lat. 5° 55' n., long. 80° 38' e. As compared with Cape Comorin, the corresponding point in the peninsula of Hindustan, it more directly faces the Indian Ocean, and lies nearer the grand thoroughfares of eastern commerce. An adjacent village of the same name has 900 inhabitants.

DONE, *dŭn* [pp. of Do, which see]: performed; finished; agreed. DONE BROWN: see under BROWN.

DONEE: see under DONATION.

DONEGAL, *dŏn-ĕ-gawl'*: maritime county in Ulster province, Ireland, washed by the Atlantic on the n. and w.; greatest length, 85 m.; greatest breadth, 41; average, 27;



## DONEGAL—DONELSON.

1,870 sq. m., one-third being arable, and one-one-hundred-and-sixtieth in wood. Pop. (1841) 296,448; (1851) 255,160; (1871) 218,334; (1881) 205,443, of whom 157,224 were Rom. Cath., 24,626 Episc., 21,306 Pres., 3,287 of other sects; (1901) 173,722. The coast-line is 395 m. long, indented by deep bays and loughs, 2 to 20 m. broad, and 15 to 25 long. Some of the coast cliffs rise from 500 to 800 ft. Of the many isles off the coast, 17 are inhabited. Except a small tract in the e. and s.e., the surface is mountainous, moory, and boggy, with many small lakes and rivers, associated with endless fairy tales and traditions. The highest hill, Erigal, rises 2,462 ft., and several other hills exceed 2,000 ft. The mountain-ridges run n.e. and s.w. The largest stream is the Foyle, running 16 m. n.e. into Lough Foyle. Derg is the largest loch. The geological structure of D. consists of granite, metamorphic rocks, and graywacke, with Devonian and carboniferous limestone strata and trap. White marble occurs at Dunlewy. Except on the Foyle, the climate is moist, raw, and boisterous from violent w. and n.w. winds. There are many ruins of houses and churches overwhelmed with sand. Of the Irish counties, D., in ratio to its area, has least land in cultivation and occupied by towns and woods. The soil is generally cold and poor on the primitive rocks, and light clay on the slaty. In 1890, there were in crop 165,536 acres, the largest proportion being oats, potatoes, turnips, and flax. There are manufactures of linen, worsted stockings, worked muslins, and kelp, and fisheries of cod, sole, plaice, herring, and mackerel. Trade is chiefly through Londonderry. Inaccessible retreats and abundance of turf-fuel made D. at one time the chief seat of illicit distillation in Ireland. It contains 6 baronies, 8 poor-law unions, and 51 parishes. D. sends four members to parliament. The towns are small, the chief being Lifford, the county town; Ballyshannon, Letterkenny, Rathmelton, Donegal, and Killybegs. Industrious farmers and artisans occupy the low fertile tracts. The population of the mountain districts has been much diminished by emigration. Till 1612, when James I. planted Ulster with English and Scotch settlers, the s. part of D. was called Tyrconnel, and belonged to the O'Donnells, who, from the 12th c., were inaugurated as Princes of Tyrconnel on Doune Rock, near Kilmacrenan. D. has many ruins and traces of forts, of 30 religious houses, castles, and of the palace of the North Irish kings on a hill near Lough Swilly. Near Derry is the coronation-stone of the ancient Irish kings. D. contains many memorials of St. Columba. Warren, 1798, captured a French fleet off Tory Isle. This isle contains the remains of seven churches, two stone crosses, and a round tower. St. Patrick's Purgatory is on an isle in Loch Derg.

**DONELSON**, *dōn'el-sŭn*, **ANDREW JACKSON**: politician: 1800, Aug. 25—1871, June 26; b. near Nashville, Tenn. He graduated 1820 at the U. S. milit. acad. and for two years was aide to his uncle, Gen. Andrew Jackson, gov. of the terr. of Fla. He resigned 1822. studied law and was admitted to the bar. When Jackson was elected pres., D. became his confidential adviser and private sec., so acting



to the close of his second administration. He was appointed 1844 *chargé d'affaires* to the republic of Tex.; 1846 minister to Prussia; 1848 minister to the German federal govt., resigning 1849. Quitting the Democratic party 1853 he joined the American party, and was nominated and defeated for vice-pres. 1856. He then retired from political life to his extensive estates. He published *Reports of Explorations* (1855).

DONELSON, FORT, *dōn'el-sŭn*: Confederate fortification on the left bank of the Cumberland river in n. w. Tenn.; 12 m. from Fort Henry on the right bank of the Tennessee river and connected with it by road—both forts being 40 m. above the junction of these rivers with the Ohio. They commanded the navigation of the Cumberland and Tennessee rivers, and were of great importance to the Confederates operating in the region between Memphis and Bowling Green in the winter of 1861-2. In 1862, Jan., a combined attack upon these works was planned for the Union army and navy. On Feb. 2, a fleet of 7 vessels under command of Com. Andrew H. Foote, left Cairo, Ill., and was followed by an army of 15,000 men under command of Gen. Grant in transports. On the 6th, without waiting for Gen. Grant, who was detained by bad roads, Com. Foote opened fire on Fort Henry, defended by 17 guns and 3,000 men under command of Gen. Tilghman, and forced its surrender in a little over an hour, but owing to the delay of the army all the garrison except Gen. Tilghman and about 70 men escaped to Fort Donelson. Gen. Grant began the land movement against Fort Donelson Feb. 12, the advance of his army reached the land front that night, invested the lines, and made an unsuccessful attack and assault the following day. The fleet arrived on the 14th. Meantime the garrison had been strengthened by that from Fort Henry and by the commands of Gens. Pillow, Buckner, and Floyd, the whole aggregating 20,000 men. The fleet opened fire a few hours after arrival, but in less than 2 hours every vessel was disabled and had to withdraw. On the 15th the Confederates made a sudden sally upon the investing lines, but after an engagement lasting from 5 A.M. till 5 P.M. were repulsed and forced within their works by a general Union advance. The loss on each side in killed, wounded, and prisoners was about 2,000. While Gen. Grant was arranging for a general assault the following morning, the Confederate generals held a council of war, agreed to the necessity of surrender, and then Gens. Floyd and Pillow with nearly 2,000 men escaped under cover of the darkness, leaving the command and formal act of surrender to Gen. Buckner. Seeing the futility of any resistance, Gen. Buckner surprised Gen. Grant early in the morning by dispatching a flag of truce with an inquiry as to terms of capitulation, to which the Union commander made the memorable reply: 'No terms other than unconditional surrender can be accepted. I propose to move immediately upon your works.' The surrender followed at once, by which 14,625 prisoners, 65 cannon, 17,600 small arms, and large quantities of stores and ammunition fell into Gen. Grant's hands. Gens. Floyd and Pillow were censured and suspended from their commands for their conduct. Gen.

## DONETZ—DONIS CONDITIONALIBUS.

Buckner acted as a pall bearer at the funeral of Gen. Grant 1885, and was elected gov. of Ky. 1887.

**DONETZ**, *dō-něts'*: river of s. Russia; chief affluent of the Don; rises in the govt. of Koorsk, and after a s.e. course of 400 m. through the govts. of Kharkov and Don Cossack, joins the Don on the right 40 m. n.e. of Novo-Cherkask; has fertile banks and a deep channel; receives the waters of the Oskol, Aidar, and Kalitva from the n.; is navigable as far up as Smiev; and has the towns of Bielgorod, Smiev, Izioom, and Slavianoserbsk on its banks.

**DONGAN**, *dōn'gan*, THOMAS, Earl of Limerick: 1634-1715, Dec. 14; b. Castletown, co. Kildare, Ireland: colonial gov. of N. Y. After serving in the British and French armies and attaining the rank of col., he was appointed lieut.-gov. of Tangiers by Charles II., and colonial gov. of N. Y. by the Duke of York 1682. He gave the city of New York its first charter 1686, and, being accused of ignoring his pacific instructions regarding the French and Indians and of inciting the Five Nations to war, resigned his commission 1688, returned to England 1691, and inherited the earldom of Limerick 1698. He died in London.

**DONGARPUR**, *dōn-gâr-pŭr'*: fortified town of Rajputana, Central India; lat. 23° 50' n., long. 73° 45' e.; 345 m. n. of Bombay. It is cap. of the protected state of DONGARPUR, which contains 1,440 sq. m., and 175,000 inhab.

**DONG-NAI**, *dōng-nā'*: river in Anam or Cochinchina, an oriental state which has recently derived an adventitious interest from the combined incursions of France and Spain. The river enters the Chinese Sea, by various mouths, about lat. 10° 20' n., and long. 107° e. It is navigable for large vessels as far up as Sai-gon, which, with pop. 180,000, and trade of great value, stands 40 m. from the coast. From this city, a canal of 23 m. connects the D. with the Menam-kong, or Cambodia, which, in a more westerly channel, divides Anam from Siam.

**DONG-NAI**: town on an affluent of the river D., in Anam; 25 m. n.e. of Sai-gon.

**DONGOLA**: the name of a province of Egyptian Sudan, Central Africa; and also of the cap. of the same, on the Nile, lat. 19° 10' n., long. 30° 22' e. After the revolt of El Maldī (1882-5), one part of the province was occupied by the British and the other by the Italians. The latter on being defeated at Adowa, Abyssinia, 1896, Mar. 1, temporarily evacuated Kassala, an important strategic town. On perceiving this move the Dervishes sought to occupy the place, but they were twice repulsed by the Italians on Apr. 2, when it was estimated that there were 15,000 Dervishes in the vicinity. This activity by the latter led to an Anglo-Egyptian expedition under Gen. Kitchener, Sirdar of the Egyptian Army, and by 1896, Sept. 30, the province had fallen into his hands.

**DO'NIS CONDITIONALIBUS**, STATUTE DE, called also the Statute of Westminster the Second 13 Edw. I. c. 1: statute which established in England the power of creating an Entail (q.v.). Before the passing of this act, it had been



held by the judges that a conveyance to a man and the heirs of his body was a fee-simple conditional, i.e., a Fee-simple (q.v.) on condition that the donee should have heirs of his body; and this condition having been purified by the birth of an heir, the donee was at liberty to alienate or burden the land, and thus to defeat the original gift. In this respect, however, the gift differed from a fee-simple, that if the donee failed to exercise his power of alienation, and died without issue surviving, the land descended not to the heirs of the donee, but to those of the donor. To counteract the decision of the judges above noticed, the statute *de donis* was passed. It provided 'that the will of the giver, according to the form in the deed of gift manifestly expressed, shall be from henceforth observed.' From the date of this act, the courts recognized two estates in the land—viz., that of the donee, which is called a Fee-tail (q.v.); and that in the donor, which was a reversion or expectancy, by which, on the termination of the estate-tail, the lands would revert to the original owner. As to the manner in which even this intention was defeated, see ENTAIL. Not only lands, but rents, dignities, etc., might be entailed under this act. *Co. Litt.* 20 a.

DONIZETTI, *do-nē-dzët'tē*, GAETANO: 1798-1848; b. Bergamo, Lombardy: famous Italian composer. He learned the elements of music at the Lyceum of that town, and later, the art of composing under Simon Mayr. D.'s first compositions were of church-music, but the only success that he obtained by them was an appointment as a chorister at the church of Basilica di San-Maggiore. D. gave up that position very soon, and after several vicissitudes, entered the military service of Austria. D. then applied himself to the composing of operas, of which he has left more than 60. *Enrico di Borgogna*, 1819, with 19 others that followed, failed to produce any marked result; and it was not until 1831 that his renown began to spread beyond Italy. *Anna Bolena*, *L'Elisir d'Amore*, *Lucrezia Borgia*, *Marino Faliero*, *Lucia di Lammermoor*, *La Fille du Régiment*, followed each other in rapid succession, adding new lustre to his fame. D.'s last productions were *Don Sebastiano* and *Caterino Cornaro*. He died at Bergamo. Among modern Italian composers, D. is reckoned nearest to Rossini, whose style he imitated during the first stage of his career. D.'s music is praised not so much for melody as for dramatic truth and solidity of execution.

DONJON, n. *dōn'jōn* [F. a turret, a tower—either from *dun*, an elevation natural or artificial on which it was placed, or from mid. L. *domniōnem*, a tower which dominates—from L. *domīnum*, a lordship (see DUNGEON)]: principal tower or keep (q.v.) of a castle (q.v.) or fortress. From the circumstance that the lower or underground story of the donjon was used as a prison, has come the modern meaning of the word Dungeon. See CASTLE.

DON JUAN, *dōn jū'an*: a legendary and mythical personage like Dr. Faustus. The two have been made the representatives of two different tendencies, both proceeding

from the same principle—from the principle, namely, of unbelief and godlessness, which necessarily turns self into either a god or a beast—the principle of subjectivism, or selfishness become dominant. In Faust, expression has been given to the subjective idealism of the Germanic nations, their tendency to subtle speculation and a rationalism antagonistic to faith. In D. J. appear the practical materialism and refined sensualism of the Romanic peoples, and the tendency of blind belief in a corrupt catholicism to pass into unbelief.

Although Faust and D. J. have thus the same source and the same termination, yet as they proceed from opposite poles, they stand in contrast to each other, and, as was natural, have found different vehicles of expression—Faust in poetry, D. J. in music. The ideal of the D. J. legend is presented in the life of a profligate who gives himself up so entirely to the gratification of sense, especially to the most powerful of all the impulses, that of love, that he acknowledges no higher consideration, and proceeds to murder the man that stands between him and his wish, fancying that in so doing he had annihilated his very existence. Partly in wanton daring, partly to allay all uneasy misgiving, he then challenges that Spirit in which he disbelieves to demonstrate to him its existence in the only way he holds valid—namely, through the senses. When this actually happens, when the Spirit proves its existence and power by animating the marble statue which he had, with daring mockery, invited as his guest, and summoning him to the final tribunal, compels him to acknowledge the supremacy of spirit, and the worthlessness of a merely sensuous, godless, and immoral existence, it is all over with him, he is crushed, and sinks into hell.

This ideal career is aptly localized in one of the most luxurious cities of the once world-monarchy of the Saracens—viz., Seville—and the characters wear the names of the ancient noble families of the place. The hero of the story, D. J., is described as a member of the celebrated family Tenorio, and is represented as living sometimes contemporary with Peter the Cruel, sometimes with Charles V. The chief aim of his sinful career is the seduction of the daughter of a governor of Seville, or of a nobleman of the family of the Ulloas. Being opposed by the father, he stabs him in a duel. He then forces his way into the family tomb of the murdered man, within the convent of San Francisco, causes a feast to be prepared there, and invites the statue which had been erected to his victim to be his guest. The stone guest appears at table as invited, compels D. J. to follow him, and, the measure of his sins being full, delivers him over to hell. At a later period, the legend came to be mixed up with the story of a similar profligate, Juan de Marañá, who had in like manner sold himself to the devil, but was at last converted, and died as a penitent monk in the odor of sanctity.

The genuine legend of D. J. was put into form first by Gabriel Tellez (Tirso de Molina), in *El Burlador de Sevilla y Convivado de Piedra*. This drama was transplanted to the



## DONKEY—DONNE.

Italian stage about 1620, and soon found its way to Paris, where numerous versions of it, among others Molière's *Festin de Pierre* (1669), made their appearance. It was brought on the English stage by Shadwell under the title of *The Libertine* (1676). In the end of the 17th c., a new Spanish version of Tellez's play was prepared by Antonio de Zamora, and brought on the stage. It is this version that forms the groundwork of the latter Italian versions and of Mozart's opera. It was first put into an operatic form by Vincenzo Righini in *Il Convitato di Pietra* (1777); the text of Mozart's *Don Giovanni* was written by Lorenzo da Ponte (1777). Through this famous opera the story became popular all over Europe, and has since furnished a theme for numbers of poets, playwrights, and writers of romance. A. Dumas has a drama, *Don Juan de Maranna*; Byron's *Don Juan* follows the name, and so far the character, of the original; and Prosper Mérimée's novel, *Les Ames du Purgatoire, ou les Deux Don Juan*, is founded upon it.

**DONKEY**, n. *dōng'kǐ* [comp. Gael. *dona-eachan*, an inferior little horse—from *dona*, bad; *eachan*, a little horse: perhaps *dun*, an old familiar name for a horse from the prevailing color, and *key* for *kin*, a diminutive termination]: an ass; a well-known domestic animal; [Ger. *dummkopf*, thick head, a blockhead]: a stupid person. **DONKEY-ENGINE**, in a *steam-ship*, a small engine used for pumping water into the boilers, raising weights, etc. . .

**DONNA**: see under **DON**, n.

**DONNE**, *dōn*, **JOHN**, D.D.: 1573–1631; b. London: son of an eminent merchant, cadet of an ancient family in Wales. His parents were Rom. Catholics, and he was educated in that faith. At the age of 11 he went to Oxford, where he remained three years; thereafter, he removed to Cambridge. Although he greatly distinguished himself at these seats of learning, the faith of his parents prevented his taking a degree. At the age of 17, he entered Lincoln's Inn, to read for the bar; and while so engaged, he carefully studied the principal points in dispute between Rom. Catholics and Protestants, and finally joined the latter. About this time, he wrote several of his minor poems, the erotic heat of which contrasted strangely with the austerity of his later years. In 1594, he went abroad, and lived three years in Spain and Italy. On his return, he was made sec. to Lord Ellesmere, then lord keeper of the great seal. Here he fell in love with that nobleman's niece, and they were privately married. When the union was discovered, D. was imprisoned by the enraged nobleman. After his liberation, he recovered his wife by legal process, and, without settled employment, went to reside at the house of Sir Francis Wooley, kinsman of his wife. After the death of Sir Francis, he removed to London, and lived with Sir Robert Drury, in Drury Lane. With Sir Robert he went to Paris; and on his return, at the instigation of James I., who was delighted with the *Pseudo-Martyr*, a book which D. had written against the Rom. Catholics, he entered holy orders. He was made D.D. by the Univ. of Cambridge;

and after accompanying an embassy to the queen of Bohemia, he was made on his return Dean of St. Paul's, and vicar of St. Dunstan's. He died of a fever. His life has been written by Izaak Walton—forming one of the group of 'lives' so praised by Wordsworth in a celebrated sonnet.

D's works consist of satires, elegies, religious poems, complimentary verses, and epigrams; they were collected and published by his son 1650. An earlier but imperfect collection appeared 1633. D. is usually considered the first of a series of poets of the 17th c., who, under the infelicitous name of the Metaphysical Poets, fill a conspicuous place in English literary history.

DONNELLY, IGNATIUS: an American author; 1831, Nov. 3—1901, Jan. 1; b. in Phila., Pa.; was admitted to the bar in 1852; removed to Minn. in 1856; gov. of the state in 1859; and a member of Congress 1863-9. Among his writings are an *Essay on the Sonnets of Shakespeare*; *Atlantis, the Antediluvian World*; *The Great Cryptogram*; *Ragnarok*; *Caesar's Column*; *A Story of the Twentieth Century*; *The Golden Bottle*, a political novel; *Doctor Huguet*; *The American People's Money*; etc. He also wrote the preamble to the Omaha platform of the People's party.

DONNYBROOK, *dŏn'ĩ-brŭk*, or ST. MARY'S OF DONNYBROOK: parish and village of co. Dublin, now part of Pembroke, a suburb of Dublin, Ireland; famous for its annual 15-days' fair, beginning Aug. 26, granted by King John for the sale of horses and cattle, subsequently reduced to one week and restricted to pleasure, and abolished on account of the tumults, broils, and various excesses of its participants, 1855. The Dodder river is here crossed by a handsome bridge, and the village contains a beautiful church, magdalen asylum, lunatic asylum, several high grade schools, a dispensary, hospital for incurables, and a number of mills. Pop. abt. 2,000

DONOR: see under DONATION.

DON QUIX'OTE: see CERVANTES.

DONZEL, n. *dŏn'zèl* [It. *donzello*; Sp. *doncel*; OF. *donzel*—from L. *doncellus*, *dominicellus*, dim. of L. *dominus*, a lord, a master]: a young gentleman following arms but not yet knighted; a young squire or attendant; a page.

DOO, *dó*, GEORGE THOMAS: one of the best English historical engravers: 1800, Jan. 6—1886, Nov. 13: b in the parish of Christ Church, Surrey, England. He is known best by his famous plate of *Knox Preaching before the Lords of the Covenant*, after Wilkie; while his admirable rendering of Eastlake's *Italian Pilgrims coming in Sight of Rome*, his exquisitely finished heads of women and children, after Lawrence, his engravings from Raffaello, Correggio, and others, have won for him a very high esteem. In 1851, he was elected a fellow of the Royal Soc., and, 1856, a Royal Academician. He was appointed chairman of the engravings committee of the London International Exhibition of 1862. In 1864, he



## DOOB-GRASS—DOOM PALM.

completed, after eight years' work, a large engraving of the *Raising of Lazarus* by Sebastian del Piombo.

**DOOB-GRASS**, or **DOUB-GRASS**, n. *dōb-grās* [Hind. *dub*]. *Cynodon dactylon*, a perennial creeping grass, prized in Hindustan as excellent food for cattle. It was brought into the United States from Europe.

**DOOBOOKA**: see **DUBOOKA**.

**DOODLE**, n. *dō'dl* [Scot. *dawdle*, to be indolent or slovenly]: a trifle; a simpleton.

**DOODLE-SACK**, n. *dō'dl-sāk* [Ger. *dudelsack*]: the bagpipe.

**DOOLY**, or **DOOLEE**, n. *dō'li* [Skr. *dola*, a swing litter]: in the *E. Indies*, a litter suspended from men's shoulders for carrying persons; a palanquin.

**DOOK**, or **DOUK**, n. *dók* [etym. doubtful]: a wooden plug or block inserted in a brick or stone wall for the subsequent attachment of the finishing pieces; the act of dipping, ducking, or bathing; a bath; in *swim.*, the same as dip-working (q.v.).

**DOOM**, v. *dóm* [AS. *dom*, judgment; *deman*, to judge: Icel. *domr*; Goth. *doms*, judgment: Lith. *dumá*, mind, thought: Gr. *thumos*, breath, life]: to sentence; to condemn; to destine: N. judgment, fate; destiny; ruin; destruction. Doom was the old name given to the last judgment, and to those representations of it in churches which have a religious rather than an artistic object. Many of the dooms are executed in distemper. In the reign of Edward VI. most of them were washed over, or otherwise obliterated, as superstitious. A fine one remains in the church of the Holy Trinity at Coventry, England. **DOOM'ING**, imp. **DOOMED**, pp. *dómd*. **DOOM-BOOK**: see **DOM-BOC**.—**DOOMSDAY**, n. *dómz-dā*, the day of judgment; the last great day. **DOOM'FUL**, a *-fûl*, full of destruction. **DOOM'STER**, n. *-stér*, in *Scot.*, the hangman; one who pronounces the *doom* or sentence: see **DEEMSTER** (under **DEEM**).—**SYN.** of 'doom, n.': sentence; condemnation; destiny; decree; fate; lot; penalty; retribution; judgment.

**DOOM (or DUM) PALM** (*Hyphæne Thebaica*): species of palm remarkable for repeated forkings of its stem. It is a native of Upper Egypt and of central Africa. In some districts it is the most plentiful tree, sometimes even forming forests, sometimes growing amid the very sands of the desert. Its leaves are fan-shaped. Ropes are made of the fibre of its leaf stalks. Its fruit is about the size of an orange, but of somewhat elongated irregular shape; the outer skin is red, and this being peeled off, a considerable thickness of a spongy dry substance is found within it—also part of the *pericarp*—which has an insipid sweetness, and a remarkable resemblance to gingerbread, so that the tree is sometimes called the **GINGERBREAD-TREE**. This substance is used as an article of food, and an infusion of it as a beverage. The infusion is cooling, gentle aperient, and very salutary in fevers. The albumen of the seed is hard and semi-transparent, and is turned into beads and

other little ornaments. Each fruit contains one seed.



Doom Palm (*Hyphaene Thebaica*).

Egyptian bdellium (see BDELLIUM) is said to be an exudation of this palm.

DOOMSDAY-BOOK: for DOMESDAY, which see.

DOON, *dŏn*: Scotch river, rising in the s.e. of Ayrshire in Loch Enoch. It runs n.w. through Loch Doon (5 m. long, three-quarters of a mile wide, amid treeless mountains), past Dalmellington, Burns's Monument and Alloway Kirk, to the Firth of Clyde two m. s. of Ayr. It is 30 m. long. On leaving Loch Doon, the river flows through Glen Ness, a huge rocky and wooded ravine, not surpassed in picturesque beauty by any scenery in Scotland. On an islet in the loch are the ruins of Doon Castle, where Edward, brother of Robert Bruce, it is said to have lived. Burns has immortalized the D. in song.



## DOOR.

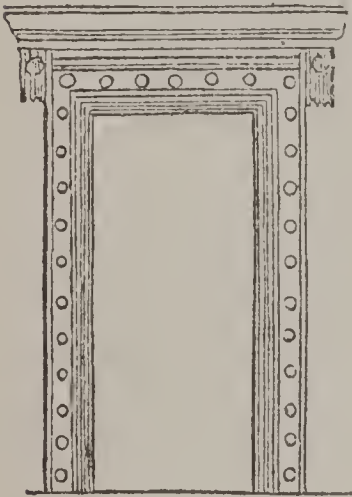
**DOOR**, n. *dōr* [Goth. *daur*; Ger. *thor*; Skr. *dvār*; Gael. *dorus*; Gr. *thura*, a door]: an opening into a house or other building, or into a room or closet of a house; the movable frame of wood which closes an entrance. **DOORLESS**, a. deprived of a door. **DOOR-NAIL**, the plug, plate, or knob on which a door-knocker strikes. **DOOR-FRAME**, n. in *carp.*, the structure in which the panels are fitted. It is composed of the stiles, or upright pieces at the sides; the muntions, or central upright pieces; the bottom rail, the leek or central rail, and the top rail; the case into which the door is fitted. **DOOR-KEEPER**, one who guards an entrance; a porter; a janitor; in legislative bodies in the United States, officer chosen by vote of the body, or appointed by official authority, to have charge of the rooms: he announces messages (from the pres., gov., etc.), dispatches documents, and is an assistant of the sergeant-at-arms in keeping order. **DOOR-PLATE**, a plate of zinc or brass on the outside of a door with the name of the occupant engraved upon it. **DOOR-ROLLER**, a suspension device for a sliding-door in which the roller of the door-hanger runs on a track-plate or rod; used for doors of farms, warehouses, luggage-vans, etc. **DOOR-SILL**, the threshold. **DOOR-STEAD**, the entrance of, or the parts about, a door; a door-way. **DOOR-STRIP**, a strip attached near the lower edge of a door to shut down tightly upon the threshold beneath when the door is closed. **DOORWAY**, n. the entrance into any building; means of approach. **DOORWAY-PLANE**, in *arch.*, the space included between the intrados of a large archway and the actual door of entrance. **WITHIN DOORS**, in the house. **WITHOUT DOORS**, out of the house. **TO LIE AT THE DOOR**, to be imputable or chargeable to one. **NEXT DOOR TO**, bordering on; near to. **NEXT DOOR TO A FOOL** [OE. *dor*; Dut. *door*, a fool, a person without light: Ice. *dára*, to decide: Gael. *dorch*, dark]: very nearly a fool; almost as dark or devoid of understanding as a fool. **WITH CLOSED DOORS**, in private.

**DOOR**, *dōr*, and **DOORWAY**, in Art: opening into a building or apartment. The form of the doorway is determined by the architectural style of the building. In classical buildings, it is generally rectangular in form, though both Greeks and Romans, following the Egyptians, among whom the practice was almost universal, occasionally diminished the opening toward the top; and the Romans, in later times, very frequently threw over it the circular arch, which was the characteristic feature of their style. Egyptian doorways are known to us, for the most part, only by the examples which remain in monumental structures; and these, like the other members of the style as thus exhibited, are of gigantic proportions. The doorway of the temple at Edfu measures 74 ft. to its summit, but the lintel and cornice which cover it are so deep and massy as to occupy a space of no less than 23 ft., so that the height of the aperture is only 51. With the Egyptians, the doorway was an architectural object of very great importance. On either side of it, colossal statues or obelisks were placed,

## DOOR.

and the approach to it was often lined with rows of gigantic sphinxes.

The Greek doorway was surrounded by moldings, and as the lintel or top-stone which covered it projected on both sides beyond the jambs, the moldings which ran round both jutted out at the place of meeting, forming a sort of shoulders, as in the accompanying example. This arrangement, however, was by no means uniform, the moldings of the jambs being frequently quite separated from those of the architrave, as in the beautiful doorway of the Erechtheum, of which an illustration is copied from Mr. Donaldson's work on doors. The doors themselves, in antiquity, in private dwellings, were generally of wood; and in structures devoted to religious or public purposes, of metal, and occasionally of marble. They were generally panelled, and turned on pivots working in sockets. With the exception of the forms of the windows, and the tracery and foliage of the pillars, doorways are the most characteristic feature in all the styles of Gothic architecture. In the earliest, which in Britain is called Saxon,



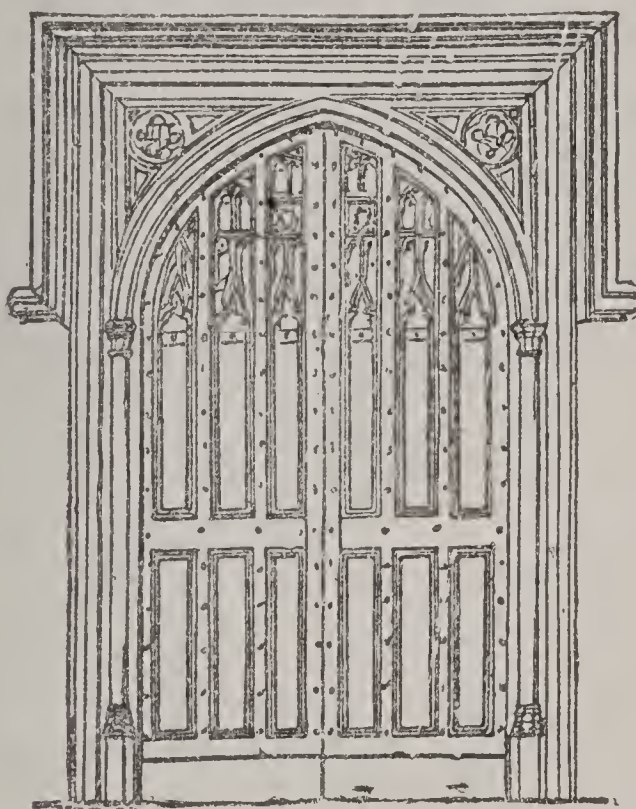
Doorway of Erechtheum.

and which on the European continent is commonly known as Romanic, they are of course very plain. There is seldom more than a few simple moldings, surrounding a semicircular, arch and in some of the earliest examples, the head of the opening is covered by two flat stones leaning upon each other in the centre, and their other ends being placed on the imposts, so as to form a triangle. In the Norman style, they become gradually more ornamental. The arch still continued in general to be semicircular, though there are a few instances of the segmental or horseshoe arch. As the style advanced, the moldings and enrichments became more various. Of these, that which is most characteristic of the style is the zigzag molding. Circular or octagonal shafts were now frequently placed in the jambs, and these, too, were often ornamented with zigzag or spiral moldings, their capitals being enriched with foliage or grotesque heads or figures. The opening of the doorway often does not rise higher than the springing of the arch, and in this case it is generally flat, the semicircular space between it and the arch being frequently ornamented with a sculptured representation of some scriptural subject. The few Norman doors that exist are devoid of ornament, with the exception of projecting nails, and a simple iron scrollwork projecting from the hinge, and stretching to a greater or less extent over the door. As the doorway adheres strictly to the characteristics of the style, early English doorways of course generally terminate in pointed arches. In these the moldings are more numerous, the jambs contain a greater



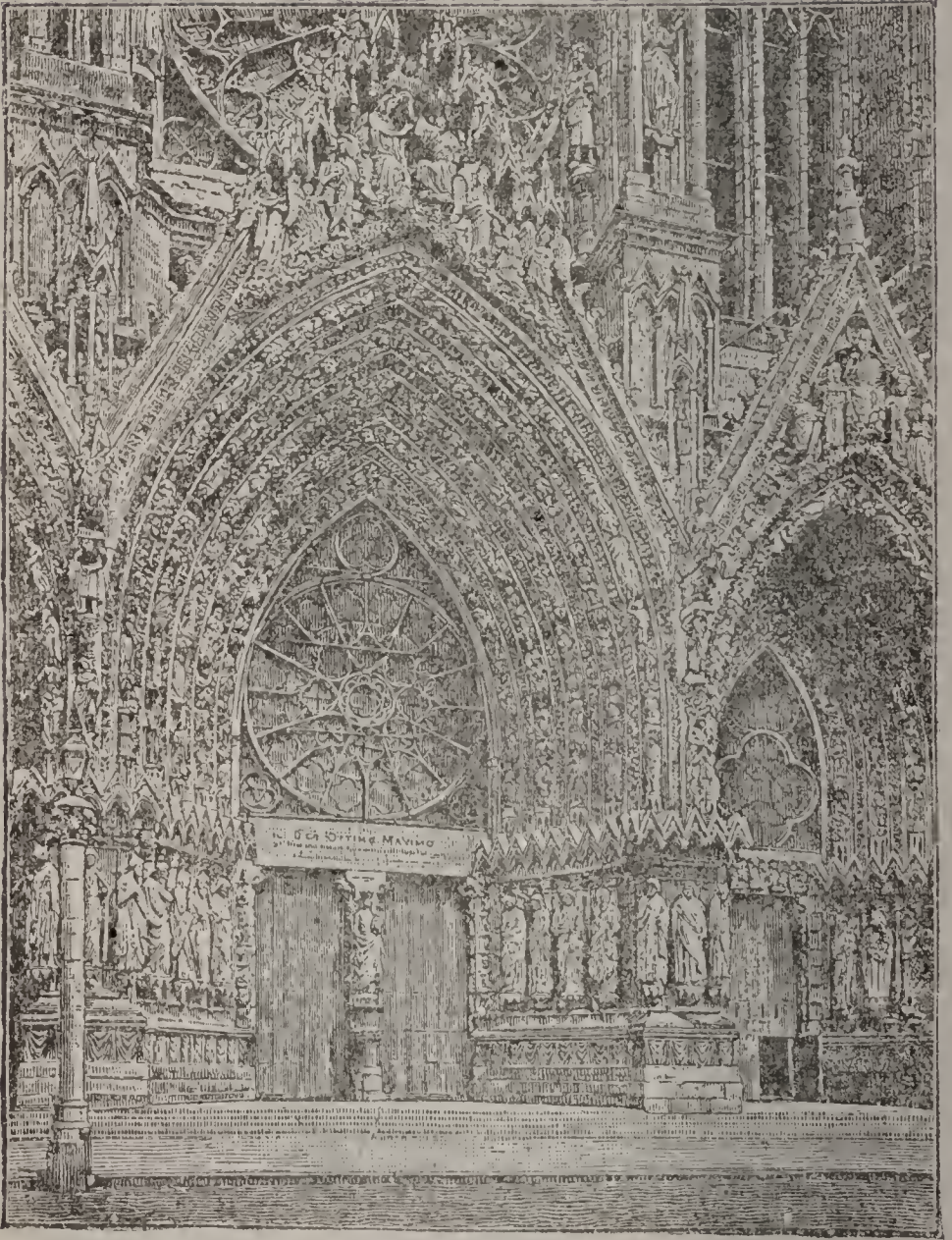
## DOOR.

number of small shafts, some of which occasionally s. and quite free, and on the whole the work is richer in form, and more finished in execution. The opening of the doorway is now frequently divided into two, either by a single shaft or a clustered column. In the decorated style, the doorways are not in general so deeply recessed as in the early English; and this takes from them in richness more than they gain in elegance by their greater height, and by the more delicate character of their ornamentation. In these, the moldings are commonly enriched with flowers or foliage, either in running patterns or placed separately at short intervals. Of these, the commonest are the ball-flower (q.v.), and a flower of four leaves, which often projects boldly, and produces a fine effect. The iron scroll-work on the doors resembles that in the former style, except that the terminations are more frequently worked into leaves or flowers. In other cases, the doors are panelled,



Perpendicular Doorway:  
From the Bishop's Palace, Lincoln.

and covered with characteristic tracery. In the perpendicular style, though the door continues arched, it is usually placed under a heavy square external molding. The doorway in this style loses much of the depth and richness which belongs to it in the earlier styles. Shafts are used in the jambs, though not always, and they are generally small and few in number; the capitals of the jambs rarely possess the same richness of foliage, and frequently consist merely of plain moldings. One or more large hollows are often left in the jambs, forming small niches, which frequently contain statues. This latter characteristic



Door.—Portal, Rheims Cathedral.



seems peculiar to the perpendicular style. In the doorways, as well as in the windows of this style, the four-centred arch came into general use, but two-centred arches, and, in small doorways, ogees, are frequently seen. The doors in the perpendicular style, when ornamented, are usually panelled, the upper parts being sometimes covered with tracery, entirely lacking the fine iron scroll-work of the earlier styles.

The Door is the movable panel by which the opening to a building, apartment, closet, or passage is closed. Doors are made of wood, iron, bronze, or stone. When moving horizontally on hinges, they are called *swing-doors*; when two such are used to close one opening, they are *fold-ing-doors*. *Sliding-doors* are those which move on rollers, and may be pushed aside. A *jib-door* is one concealed as much as possible when shut. A *trap-door* is one which opens vertically over a horizontal opening, as a hole in the floor, etc. When a small door closes an opening cut in a larger one, it is usually called a *wicket*.

Doors are commonly of wood. The most simple is of several boards joined together at their edges by a *rebate*, or a *plowed and tongued groove* (see CARPENTRY figs. 19 and 20); these are held together by a transverse piece simply nailed to each board; this is called a *ledge*, and a door thus made, a *ledge-door*. These are commonly used for workshops, stabling, etc.; but when durability and appearance are to be combined, a stout frame is first made, its parts joined together by mortise and tenon. See CARPENTRY, fig. 9. This frame has one or more openings—often four—filled with thin pieces called *panels*, fitted into grooves plowed in the edges of the frame. The horizontal pieces of the frame are, according to their position, called the top-rail, bottom-rail, lock-rail, and frieze-rail. The lock-rail is that to which the lock is fixed, the frieze-rail intermediate between the middle and top-rail in large doors. The extreme vertical parts of the frame to which the rails are fixed are called *stiles*, and the intermediate vertical part, a *mount-ing*. Doors are named one, two, four, six, etc., panelled doors, and are further described by a kind of molding which surrounds the panel, and from the description of panel. The main object of framing, besides appearance, is to counteract the tendency of the wood to warp, by binding the different parts together with pieces having their fibres at right angles to each other.

In many old buildings, the outer, and even some inner doors are made of massive oaken planks, bound together with ornamental iron straps. Iron doors are used chiefly for protection against fire. For this purpose, they are best made of wrought iron, with double sides. Bronze doors, sometimes used for churches and other large buildings, are usually ornamented with castings in high and low relief. Those of the Baptistery of the cathedral of Florence, by Ghiberti, and the Pantheon of Rome, are among the most celebrated examples. Marble doors are seen chiefly in cemeteries and some Belgian churches.

DOO'RA: see DURRA.

DOORBA, *dôr'ba*, or DOORDA, *dôr'da*, or DURVA, *dôr'-va*: see CYNODON.

DOORGA, or DOORGAH, or DURGA, *dôr-ga* [Bengalee, etc.—from Skr. Properly the appellation of a giant slain by Doorga, to whom, consequently, his name was transferred. Some suppose that in its wider meaning it implies that which is difficult of approach, inaccessible, impenetrable, or unattainable; or it may be from the Skr. partiele *dur*, difficult, troublesome, and *gam*, to be known, or it may be from *dur*, bad, vile, ill, and *gai*, to sing, Doorga being extolled in the hymns and songs of the wicked]: in *Hindu myth.*, principal wife as well as the mother of Siva, one of the gods belonging to the Hindu triad. The name Doorga is her appropriate appellation in Bengal, but in southern and western India she is generally Purwutee, or Parvati. Her great exploit was slaying the giant Doorga: see DOORGA POOJAH. Doorga has other names, among which is Bhagabati, and Kalee, or Kali.

DOORGA POOJAH, n. *dôr'ga pōja* [Bengalee—from Skr. *doorga* (q.v.) and *poojah*, worship]: in *Hindu festivals*, the worship of Doorga, and the festival at which that worship chiefly takes place. According to the Rev. A. F. Lacroix, of Calcutta, the image of the goddess is usually made of clay, in the shape of a female with ten arms.

DOORIAH, n. *dôr'î-ah* [various Indian languages]: a cotton cloth made in India.

DOORN, *dōrn*, in English, *Thorn*: common name in s. African geography. It indicates various communes in the Cape Colony. It also designates two rivers, distinguished as *Great* and *Little*, both joining the Olifant, or Elephant, on the right, but the smaller from the s.e., and the larger from the n. east.

DOORN'BOOM (*Acacia horrida*): most common tree in the wastes of s. Africa. The name D. (*Thorn-tree*) given to it by the Dutch colonists, and the botanical specific name, are due to the number and sharpness of its spines. It seldom much exceeds 30 ft. in height, but its timber is hard and tough, and is much used for house-carpentry, etc. See ACACIA.

DOP, n. *dōp*: in *diamond-cutting*, the copper cup in which a diamond is soldered when it is to be polished.

DOPPLERITE, n. *dōp'plēr-īt* [named after B. *Doppler*, the first to bring them to notice, and Eng., etc., suff. *-ite*]: in *mineral.*, an amorphous mineral occurring in elastic or partly jelly-like masses; found in peat-beds in Styria and Switzerland; hardness. 0·5; sp. gr. 1·089; after drying, hardness, 2—2·5; sp. gr. 1·466. When fresh, it is brownish-black, with a dull brown streak and greasy subvitreous lustre; insoluble in alcohol or ether. D. is also the name of a variety of hircite, grayish, earthy, and plastic in the fingers when fresh.

DOQUET, n. *dōk'ēt*: warrant; paper granting license: see DOCKET.

DOR, or DORR, n. *dōr* [AS. *dora*, a drone, a locust; Gael.



## DOR—DORCAS SOCIETY.

*dùrdan*, humming noise: Ir. *dordam*, to hum like a bee]: a drone bee; a beetle or cockchafer—so called from the humming sound made by animals of this class in flying: see DUNG-BEETLE.

DOR, n. *dawr* [*etym.* doubtful, but probably connected with *dor* (q.v.), the insect]: a trick; a joke; a mock imprecation: V. to cheat; to trick; to make a fool of.

DOR, *dawr*, or MONT DOR, *mōng dawr* (often written less properly Mont d'Or): chain of mountains in France comprised in the great group of the Auvergne (q.v.) Mountains in the dept. of Puy-de-Dôme. They are clearly of volcanic formation, and rise in the Puy-de-Sancy, highest peak of central France, 6,190 ft.

DORA D'ISTRIA: see GHICA, HELENA.

DORADO, n. *dō-rā-dō* [Sp. *gilt*—from *dorar*, to gild: L. *deauro*—from *aurum*, gold]: a rich man; in *astron.*, the Sword-fish, a constellation in the southern hemisphere. It is also called Xiphias; in *ich.*, a species of fish of the genus *Caryphæna*.

DORAK, *dō'rāk*: town of Persia, province of Khuzistan, on a marshy plain at the junction of the Dorak river with the Jerrahi. It is surrounded by a mud-wall, and defended by a fort. By a canal which unites the Dorak with the river Karun, considerable trade is carried on. D. is also reported to have thriving manufactures. Pop. 6,000.

DORAN, *dō'ran*, JOHN, PH.D.: 1807–1878, Jan. 25; b. London; descended from an old Irish family of Drogheda: copious contributor to miscellaneous literature. In early life he resided in France and Germany, and was educated chiefly by his father. So early as 1822 he produced the melodrama of *The Wandering Jew*, and at the age of 20 became the editor of the *Literary Chronicle*. In 1835 he wrote a history of Reading, but from that time till 1854 he confined his labors to the periodical press. In the latter year he published *Habits and Men*, followed by *Table Traits and Something on them*. *Lives of the Queens of England of the House of Hanover* appeared 1855; *Knights and their Days*, 1856; *Monarchs retired from Business*, 1857; *History of Court Fools*, 1858; *New Pictures and Old Panels*, 1859; *The Princes of Wales*, 1860; *Memoir of Queen Adelaide*, 1861. In 1864 he produced *Their Majesties' Servants*, a history of the stage from Betterton to Kean; 1868, *Saints and Sinners*; and 1873, his most interesting work, an account of Mrs. Montague and the 'blue-stockings' of her day, under the title of *A Lady of Last Century*. In 1876 he published *Mann and Manners*, the letters of Sir Horace Mann to Horace Walpole. His last work, *London in Jacobite Times*, appeared 1877. Besides being a large contributor to miscellaneous literature, Dr. D. several times edited the *Athenæum*, and at his death was editor of *Notes and Queries*.

DORCAS SOCIETY, *dawr'kas so-si'ē-tī*: association of women who supply clothes to necessitous families. The name is taken from Acts ix. 39: 'And all the widows stood

## DORCHESTER—DORÉ.

by him weeping, and showing the coats and garments which Dorcas made, while she was with them.'

**DORCHESTER**, *dawr'chès-tér*: formerly a separate town of Mass., was in 1869 annexed to the city of Boston: see **BOSTON**.

**DOR'CHESTER**: municipal borough (till 1885, parliamentary also), county town of Dorsetshire, England; 8 m. n. of Weymouth. It has considerable trade in ale and beer, and sends much butter to London. D. was the Roman *Durnovaria* or *Durinum*, a walled town with a fosse, and a chief Roman British station. Parts of the wall, six ft. thick, remained till 1802. Near D. are the remains of the most perfect Roman amphitheatre in England, 218 by 163 ft., and 30 ft. deep, the seats rising from the arena, cut in the chalk, and capable of holding 13,000 spectators. There is also a Roman camp with a ditch and a high vallum. Near D. is a large British station with three earthen ramparts, a mile and a half in circuit, and pierced by intricate passages, and inclosing barrows. The inner rampart is 60 ft. high. At D., in 1685, Judge Jeffreys, in his 'bloody assize,' sentenced to death, in two days, 109 persons implicated in Monmouth's rebellion. Pop. (1891) 7,946.

**DORDOGNE**, *dawr-dōn'*: river of France, formed by the Dor and Dogne rivers in the dept. of Puy-de-Dôme, flows s.w. and w. through the depts. of Correze, D., and Gironde, and after a course of over 200 m., of which 150 m. are navigable, enters the Gironde river 13 m. n. of Bordeaux.

**DORDOGNE**, *dawr-dōn'*, F. *dor-dōn'*: dept. in the s.w. of France, formed of the ancient province of Périgord, with small portions of Limousin, Angoumois, and Saintonge; 3,546 sq. m. The surface is for the most part hilly, and covered with broom and underwood. with here and there a valley of extraordinary beauty and fertility, inclosed with hills, the sides of which are generally clothed with vineyards. There is a great deficiency of grain, but the want, as an article of food for the inhabitants, is supplied to some extent by the immense produce of the chestnuts, which, with the walnut and the oak, are the prevailing trees in the forests. The climate is generally mild. Mines of coal, iron, and manganese are worked; marble, alabaster, and millstones are quarried. The manufactures are coarse woolens, hosiery, brandy, oil, paper, etc. D. has considerable trade in iron, wine, hams, and truffled turkeys. It has five arrondissements—viz., Bergerac, Nontron, Périgueux, Ribérac, and Sarlat, with Périgueux as capital. Pop. of dept. (1881) 492,608; (1891) 478,471; (1901) 452,951.

**DOR'DRECHT**: see **DORT**.

**DORÉ**, *do-rā'*, **PAUL GUSTAVE**: 1832–1883, Jan. 23; b. Strasburg: French artist of great and versatile power. He was educated at Paris, and very early gave indication of superior ability. His first attempts were sketches, contributed to the *Journal pour Rire* and other Paris periodicals. In 1855, he exhibited his picture *Battle of the Alma*, fol-



lowed by *Battle of Inkermann* 1857. In this year first he was heard of in England by the reissue of his illustrations of the legend of the *Wandering Jew*, the power of weird and grotesque imagination displayed in which could not fail to arrest attention. The success of this work seems to have determined his future career and thereafter he worked chiefly as an illustrator. His productiveness in this field is amazing. He illustrated editions of *Rabelais*, of the *Contes Drolatiques* of De Balzac, of Dante's *Divina Commedia*, of *Don Quixote*, of Lafontaine's *Fables*, of Milton, and of the Bible—all of which bear the impress of D.'s original genius. He illustrated also Tennyson's works, Coleridge's *Ancient Mariner*, the *Legend of the Wandering Jew*, beside executing a vast mass of miscellaneous work. *Christ leaving the Praetorium* is his most important painting. There was a Doré Gallery in London for many years, where his designs were exhibited. In 1861, D. received the decoration of the Legion of Honor. He was the most fertile and vivid designer the world has seen, and the work which he has left is enormous. As a painter, he was a failure in France, as with most persons of educated taste—his pictures being scenic representations. He had had real gifts as a sculptor.

DOREE: see DORY.

DOREMA, n. *dōr-ē'ma* [Gr., a gift, in allusion to the product of the plant]: in *bot.*, genus of plants, belonging to order *Umbelliferae*. *D. ammoniacum* yields gum ammoniac.

DOREMUS, CHARLES AVERY, PH.D.: 1851, Sep. 6 ———: chemist: b. New York; son of ROBERT OGDEN D. After graduating, 1870, at the College of the City of New York, he studied in the universities of Leipsic and Heidelberg, taking the degree PH. D. at Heidelberg 1872. He was prof. of chem. and toxicology in the Univ. of Buffalo (1877–82,) in Paris and then became asst. prof. of chem. in the College of the City of New York, lecturer on chem. and toxicology in the Bellevue hospital med. coll., prof. of chem. in the Amer. veterinary coll., etc. His writings on technical subjects are numerous and valuable.

DOREMUS, ROBERT OGDEN, M.D., LL.D.: 1824, Jan. 11 ———: chemist: b. New York; son of SARAH PLATT D. He graduated 1842 at the New York univ., and 1843–47 was asst. in the med. dept. He spent a year 1847–8 in the study of electro-metallurgy and of the processes of chemical manufacture. He opened a laboratory in New York 1848 for giving practical instruction in analytical chem. and for making commercial analyses; became prof. of chem. in the college of pharmacy 1849; received the degree M.D. 1850, and founded in the New York univ. a laboratory of analytical chem. for med. students. He was one of the founders of the Long Island college hospital 1859, and for several years a lecturer therein; became prof. of chem. and toxicology in Bellevue hospital med. coll. 1861, and 1862 was appointed also to the chair of chem. and physics in the College of the City of New York. He invented in 1862 a compressed granulated gun-

## DOREMUS—DORIA.

powder which was adopted by the French govt. and patented various chemical fire extinguishers. He actively promoted sanitary improvements in New York and introduced new methods of disinfecting hospitals and infected ships. At Bellevue hospital he established a toxicological laboratory for specially accurate work in cases of poisoning. He was an expert witness in many celebrated criminal trials and a brilliant lecturer on scientific subjects.

DOREMUS, SARAH PLATT (HAINES): philanthropist: 1802, Aug. 3—1877, Jan. 29; b. New York; daughter of Elias Haines, merchant, of New York. She became the wife of Thomas C. D., merchant, 1821. In a season of distress in Greece 1828 she organized a relief mission for distributing supplies; was for several years a generous supporter of the mission founded at Grande Ligne, Canada, by Henriette Feller; founded in New York 1842 a home for women discharged from prison, and 1850 was one of the founders of a house and school of industry for poor women. She was associated with Dr. J. Marion Sims 1855 in establishing the Woman's Hospital, and became pres. of that institution. During the civil war she was active in hospital work. She founded the Woman's Union Missionary Soc. 1860 for unsectarian work among women in heathen lands; was for many years manager of the woman's branch of the City Mission and Tract Soc. and of the Female Bible Soc.; and took an active interest in the success of the Gould Memorial, an institution designed to provide free schools for children of Italian immigrants.

DORHAWK: see GOATSUCKER.

DORIA, *do're-à*, ANDREA: 1468–1560; b. Oneglia: noble Genoese, one of the greatest admirals of his age. At an early age, he took service in the guard of the pope, Innocent VIII., and afterward distinguished himself in the battles against the Milanese and the French by Genoa and the kings of Aragon. It was D. who, 1503, after a short campaign, crushed the rebellion in Corsica. When Genoa, 1513, threw off the French domination, D. was appointed capt.gen. of the galleys, in which capacity he carried on a war of extermination against the dangerous swarms of African pirates who infested the Mediterranean. During the war between Francis I., king of France, and Charles V., emperor of Germany and king of Spain, D. commanded the French fleet, reinforced by his own galleys, and inflicted everywhere severe losses upon the enemy. After the defeat of Francis I. near Pavia, D. accepted the command of the papal fleet; but upon the return of the king from his captivity, entered once more the French service, with the title of high admiral of the Levant. He blockaded Genoa, for having espoused the cause of the emperor, and putting to flight the party of the Adorni, took the town. On finding the independence of his country threatened by the French, D. with his whole force went over to the emperor, and by so doing hastened the deliverance of Italy from French domination. In 1529, D. entered Genoa, without resistance, and refusing the title of sovereign, offered by the emperor, established there a popular form of govern-



## DORIAN—DORIAN MODE.

ment, which remained in vigor till the end of the republic. The grateful country decreed him the title of 'Father of Peace;' and the emperor, in whose service D. continued, conferred upon him the order of the golden fleece, together with the principality of Melfi. In 1532, D. won a decisive victory over the Turks near Patras, and the conquest of Tunis (1535) was chiefly his work. He took part in the joint expedition against the Turks under Barbarossa 1536, and in another against Algiers 1541, where he lost 11 of his own galleys. The tranquillity of his last years was disturbed by the conspiracy of Fieschi. D. took fierce revenge upon the conspirators for the death of his nephew Gianettino. D. died without offspring, at Genoa, in his 93d year.

DORIAN, a. *dō'rī-ăn*: pertaining to *doris*, in Greece. DORIC, a. *dōr'ik*, pertaining to the Dorians, or to Doris, in Greece; the simplest and oldest order of Greek architecture; a dialect of the anc. Greek language; any rough broad dialect. DOR'ICISM, n. *-sizm*, a phrase of the Doric dialect.—The Dorians were one of the four principal peoples of Greece, who took their name, according to the legend, from Dorus, the son of Helen, who settled in Doris; but Herodotus says that in the time of King Deucalion they inhabited the district Phthiotis; and in the time of Dorus, the son of Hellen, the country called Histiaëotis, at the foot of Ossa and Olympus. But the statement of Apollodorus is more probable according to which they appear to have occupied the whole country along the n. shore of the Corinthian Gulf. Indeed, Doris Proper was far too small and insignificant a district to furnish a sufficient number of men for a victorious invasion of the Peloponnesus. In this remarkable achievement they were conjoined with the Heracleidæ, and ruled in Sparta. Doric colonies were then founded in Italy, Sicily, and Asia Minor. Strikingly as all the four nations of Greece differed from each other in language, manners, and form of government, the D. in particular differed from the Ionians. The former preserved a certain primitive solidity and earnestness, but with it something coarse and hard. See O. Müller's *Die Dorier* (2 vols. Breslau, 1824; 2d ed. 3 vols., 1844). The *Doric dialect* bore the same character; it was harsh and rough, while the Ionian was soft and polished, yet the former had something venerable from its antiquity, and was therefore employed in hymns and choruses. In philosophy, the influence of the Doric character was particularly visible in the Pythagorean school and its attachment to the aristocracy. It is no less traceable in architecture in the strong unadorned Doric pillars, which formed so marked a contrast to the slender and decorated Ionian columns. The Doric order was the oldest, strongest, and simplest of the three orders of Greek architecture. See COLUMN: ENTABLATURE: GREEK ARCHITECTURE.

DORIAN MODE (or MOOD), or DORIC MOOD, n.: in *music*, the first of the authentic church tones or modes from D to D, with its dominant A. It resembles the key of D minor, but with B natural and no C sharp. It is

## DORIDÆ—DORLACH.

characterized by its severe tone, and is especially suited for religious or warlike music. Many of the old German chorals are written in this mode.

**DORIDÆ**, n. *dō'rĭ-dē*: in *zool.*, the Sea-Lemons, a family of naked-gilled gasteropod mollusks. **DORID**, n. a mollusk of the family *Doridæ*.

**DORIPPE**, n. *dō-rĭp'pě* [*etym.* unknown]: genus of short-tailed decapod crustaceans.

**DORIS**, *dō'rĭs*: small mountainous dist. of ancient Hellas, between Phocis, Ætolia, Locris, and Thessalia; earliest home of the Dorians. With its four towns, Boium, Cytinium, Erineus, and Pindus, it formed the Doric Tetrapolis, afterward completely destroyed by the Macedonians, Ætolians, and other nations, so that at the time of the Romans, only a few remains of these towns were visible.

**DORIS** was the name also of a dist. in Asia Minor on the coasts of Caria, inhabited by colonists from the Peloponnesus; it formed a *Hexapolis*.

**DORIS** in modern Greece, forms an eparchy of the govt. of Phocis.

**DORIS**, *dō'rĭs*: genus of gasteropodous mollusks of the order *Nudibranchiata*, the type of a family called *Doridæ*, sometimes popularly SEA-LEMONS. The body is oval, the abdomen flat, the back flat in some and elevated in others,



Doris: a, gills.

the mouth a small proboscis with two small tentacula, the vent situated in the back, and surrounded by a circle of branched or plumed gills. The species are found in all seas, many in those of Britain; but they are more numerous in

the s. hemisphere. Some attain a considerable size. Few inhabit deep water. They crawl on rocks, sea-weeds, etc., where they are often left by the tide, or swim in a reverse position; the foot, made concave by muscular action, serving to buoy them up. Some are pretty and interesting inmates of the aquarium. Gosse mentions, that specimens of *D. bilamellata* were 'very social in confinement, continually finding out one another, and crowding close up together.'—*A Naturalist's Rambles on the Devonshire Coast*.

**DORIS**: in *myth.*, a goddess of the sea, daughter of Oceanus and Tethys, and wife of Nereus, by whom she had 50 daughters, called Nereids; in *astron.*, an asteroid, the 47th found. It was discovered by Goldschmidt.

**DORKING**, *dawr'king*, or **DARKING**, *dār'king*: town in England, in the middle of Surrey, in a picturesque valley on the left bank of the Mole, 23 m. s.w. of London by road. It lies on the Roman road which ran between London and Chichester. Its chief trade is in flour, lime, and chalk from the adjacent pits. D. gives its name to a peculiar breed of domestic fowl: see **POULTRY**. Pop of D. (1881) 6,328; (1891) 7,132.

**DORLACH**, or **DORLOCH**, n. [Gael. *dorlach*, a bundle]: a bundle; apparently that kind of truss formerly worn by

## DORMANT- DORMAN-TREE.

the Highland troops instead of a knapsack; a portmanteau; a short sword; a dagger.

**DORMANT**, a. *dŏr'mănt* [F. *dormant*, sleeping—from L. *dormiēns* or *dormiēn'tem*; It. *dormente*, sleeping—from L. *dormire*, to sleep]: sleeping; inactive; sluggish; at rest; quiescent; suspended; not exercised, as a dormant peerage: in *heraldry*, an animal dormant has its head resting on its forepaws, whereas an animal couchant has its head erect.

**DORMANCY**, n. *-măn-sĭ*, quiescence; sleep; abeyance.

**DORMANT-BOLT**, n. a concealed bolt working in a mortise in a door, usually operated by a key, sometimes by a turning knob. **DORMANT-CLAIM**, n. in *law*, a claim in abeyance.

**DORMANT-LOCK**, n. a lock having a bolt that will not close of itself. **DORMANT-PARTNER**, n. in *com.*, a partner in any business whose name does not appear in the title, and who takes no active part in the management of the concern, but is entitled to a share in the profits, and also liable to a share in the losses, more commonly called a sleeping partner.

**DORMANT-STATE**, n. in *nat. hist.*, a state of torpidity in which hibernating animals pass a certain portion of the winter. **DORMER**, or **DORMER-WINDOW**, *dŏr'mŏr* [F. *dormeur*, a sleeper]: an upright window placed in a small gable rising out of a sloping roof, giving light to the chambers next the roof, often allotted for sleeping-apartments; an attic window: sometimes known as a storm-window. Dormers seem to have been invented not before the middle of the 14th c.; called also **DORMANT-WINDOW**.

**DORMITORY**, n. *-mĭ-tĕr-ĭ* [L. *dormitŏriŭm*, a sleeping-chamber; prov. Eng. *dormedory*, a sleepy person; prov. Sw. *dormeter*, sleepy]: a sleeping-room; a series of sleeping-places in a building. The term was applied especially to sleeping-apartments in monasteries, etc.

**DORMANT-WINDOW**, *dŏr'mănt-wĭndŏ* [F. *dormant*, sleeping; L. *dormant*, sleeping]: a window in a dormer.

**DORMAN-TREE**, n.; a large beam lying across the ceiling of a room, and serving as a joist; a dormond or dormant-tree.



## DORMANT VITALITY.

**DORMANT VITALITY:** peculiar condition manifested by many organized beings, and which is characterized by an apparent suspension of all the vital actions. Being in this state can scarcely be said to be *alive*, since they exhibit no vital activity, nor can they be designated as *dead*, since that implies their incapability of resuming their former state; hence, since they retain their peculiar attributes without manifesting them, the term D. V. seems appropriate for them. This condition may result either from the withdrawal of the stimuli necessary for the maintenance of vital actions (as water, heat, etc.), or it may proceed from some change in the organism itself, whereby its power of responding to these stimuli is for a time diminished or lost. The following are examples of each kind of dormant vitality.

1. Dormant vitality from the withdrawal of the necessary stimuli.

Seeds of certain plants, properly protected from air, moisture, and extremes of temperature, remain dormant, retaining their vitality for a period varying greatly with different varieties, ranging from two weeks as in the case of seeds of the willow tree, to more than a century with those of some leguminous plants. Wheat retains its vitality for an indefinite period; but the familiar story that kernels of this grain have germinated after lying 3,000 years in the pyramids of Egypt is not universally credited. Seeds deeply buried, sometimes grow after lying dormant for a very long period. This is seen in the spontaneous growth of deciduous trees where an evergreen forest has been removed, and in the growth of evergreens on land which for a century has been covered by a forest of oaks. Dr. Lindley, great English botanist, mentioned three raspberry plants which had been grown 'from seeds taken from the stomach of a man whose skeleton was found 30 ft. below the surface of the earth.' As some coins of the emperor Hadrian were found in the burial place it is thought that the seeds were 1,600 or 1,700 years old. An instance of the growth of seeds which had lain dormant for ages instead of centuries is quoted by Dr. Carpenter in his *General and Comparative Physiology*. In digging a well in a town about 40 m. from the coast of Maine a stratum of sand was struck at a depth of about 20 ft. A quantity of this sand was spread upon the surrounding soil and from it there sprang a large number of beach-plum trees. This variety had never before been seen except at the shore. The seeds must have been borne by trees which occupied the spot when it formed the coast and have retained their vitality in a dormant state through the countless years during which the ocean had been receding to its present position.

Once lost the vitality of seed can never be restored, though it can sometimes be stimulated to activity after being weakened by age. The vitality of coffee soon becomes impaired, but if soaked in a weak solution of carbonate of ammonia many of the berries will grow after being kept a considerable time. Many old seeds which will not grow under ordinary conditions can be made to germinate by placing



## DORMANT VITALITY.

them in fatty oils or soaking them from one to ten days in a weak solution of oxalic acid! The condition in which they are kept largely determines the time during which seeds will retain their vitality. Seeds taken to England from India by the land route germinate readily, while those carried by sea are very likely to fail. An excess of heat or moisture destroys the vital principle, while the abstraction of moisture beyond certain limits or a freezing temperature will be equally fatal. The dormant vitality of seeds is a beneficent provision of Providence by means of which the inhabitants of the temperate zones are enabled to grow many valuable food plants which they could not otherwise produce. Some of our most important plants ripen their seeds long before the time of sowing for a succeeding crop. If the vital principle did not remain dormant it would be necessary to sow these seeds at once; and as the young plants would be destroyed by frost, the cultivation of these crops where the winters are cold would be impossible. Dormant vitality is also a quality of the seeds of pernicious plants. A fine sod, apparently free from weeds, may be plowed, and the owner soon find multitudes of foul plants growing from seeds which were ripened when the land was under cultivation many years before and which had ever since been lying dormant in the soil.

Among the lower animals, we find several of comparatively complex structure, in which D. V. can be induced for a considerable period, as, for instance, several years by the abstraction of their *moisture*. The well-known rotifer, the wheel-animalcule, may be reduced to perfect dryness, and kept in this condition for a long time (certainly three or four years, and some writers say far longer) without evincing a sign of life, and yet it will immediately revive on being moistened. The *Tardigrades*, an allied tribe, have been desiccated by the most powerful means which chemistry affords, and have been then heated to a temperature of  $250^{\circ}$ , and have still been revived by water, though in their active state a temperature of  $120^{\circ}$  destroys them. In Woodward's *Manual of the Mollusca*, cases are recorded of living snails crawling out of shells supposed empty, and in which they must have been dormant for several years, and the eggs of snails and others of the lower animals have a still greater power of revivification after drying. Sir James Emerson Tennent describes various fishes in Ceylon which bury themselves in the mud when the pools or tanks dry up, and remain torpid until the periodic rains of that country ensue, and previous observers had noted similar facts in other tropical countries. Humboldt relates that crocodiles and boas are sometimes found alive, though torpid, in hardened mud, and revive on the application of water.

A *diminution of temperature* will induce this phenomenon in many animals. In one of Captain Sir James Ross's voyages, several caterpillars having been exposed to a temperature of  $40^{\circ}$  below zero, froze so completely, that when thrown in a tumbler they clinked like lumps of ice. When thawed, they resumed their movements, took food, and became transformed into the chrysalis state. One of them,

## DORMANT VITALITY.

which had been frozen and thawed four times, subsequently became a moth. In the N. American lakes, frozen fishes are often found in the ice, which revive when gently thawed. Spallanzani kept frogs and snakes in a torpid state for three years in an ice-house, and then revived them by warmth. The same capability does not exist, at all events to the same extent, in the warm-blooded animals. A *total* suspension of vital activity in a bird or a mammal for any length of time, from the prolonged application of severe cold, or from any other cause, is never followed by recovery. The stories of certain birds burying themselves in the mud during winter, are regarded by the best authorities as more than questionable; and in hibernating mammals (see HIBERNATION), the suspension is not total. How we are to explain, or whether we ought to believe, the remarkable cases of certain Indian fakirs, who are stated to have the power of suspending all their vital activity for days, or even weeks, we do not know. The late Mr. Braid of Manchester published a collection of these cases, directly obtained from British officers who had been eye-witnesses of them in India, in his *Observations on Trance or Human Hybernation*, 1850. We quote one of these, vouched for by Sir Claude Wade. The fakir was buried in an underground cell, under strict guardianship, for *six weeks*; the body had been twice dug up by Runjeet Singh (at whose court the exhibition took place) during the period of interment, and had been found in the same position as when first buried. In this and in all the other recorded cases, the appearance of the body when first disinterred is described as quite corpse-like, and no pulsation could be detected at the heart or in the arteries. The means of restoration employed were chiefly warmth to the vertex, and friction to the body and limbs.

2. Dormant vitality from changes within the organism.

The insect world affords us the chief illustrations of this variety of dormant vitality. The pupa or chrysalis stage of insect life is in itself one of D. V., unconnected with any of the external influences above noted. That this stage may be much shortened by artificial heat, and prolonged by artificial cold, has been known since the time of Reaumur; but, as the following case shows, there are other causes inherent in the animal itself, which tend at a certain time to prolong the pupa condition. In the *Papilio Machaon* there are two generations every year; for the butterfly that comes forth in the early summer lays eggs which rapidly pass through all the phases of insect life, and produce another set of eggs later in the season, whose *larvæ* or caterpillars turn into *pupæ* before the winter. The pupa stage of the first brood (in July) lasts only 13 days, while that of the second brood (which commences in September) lasts nine or ten months, the butterfly not appearing until the following June. The difference of temperature is obviously quite insufficient to account for the great diversity between the two periods. Several similar cases may be found in Kirby and Spence's *Entomology*.



## DORMOUSE.

**DORMOUSE**, n. *dŏr'mōws*, **DOR'MICE**, n. plu. *mīs* [L. *dormiō*, I sleep, and *mouse*: but probably OF. *dormeuse*; Lang. *dourmeire*, a slumberer, a sleepy head (see **DORMANT**)], (*Myoxis*): genus of rodent quadrupeds, ranked by some naturalists in the family *Muridæ* (rats, mice, etc.), and by others in the family *Sciuridæ* (squirrels, etc.); being, in fact, a connecting link between the two families. Their habits resemble those of squirrels; the dentition, however, more nearly agrees with that of mice. There are four molar teeth on each side in each jaw; the upper jaw has not the anterior rudimentary fifth molar, characteristic of squirrels. The molars have their summits marked by transverse ridges. There are no cheek-pouches. The ears resemble those of mice. The fore paws have each four toes and a rudimentary thumb, the hind feet have five toes. The fur is very fine and soft. The tail is long, and in the different species exhibits characters variously intermediate between those of mice and squirrels. This genus and the closely allied genus *Graphyurus* are remarkable as the only genera of rodents in which there is no cæcum. The species of D. are beautiful little animal natives chiefly of the south of Europe. Some species found also are in



Dormouse (*Myoxis avellanarius*).

Africa, and the genus *Graphyurus* is entirely African. The only British species of D. is the **COMMON D.**, **RED D.**, or **MUSCARDINE** (*M. avellanarius*), inhabitant of woods in some parts of England. It is about the size of a common mouse, with head proportionally large; has a rather pointed muzzle, large prominent eyes, and a flattened tail, thickly clothed with rather long hair; and is of a tawny red color on the upper parts, and white beneath. It is extremely gentle and easily tamed, feeds on beechmast, acorns, hazelnuts, grain, etc., and spends the colder parts of winter in a state of torpidity, though in mild weather it awakens up to consume a little of the store of food which, like squirrels, it lays up for that season. Before its hibernation begins,



## DORN—DORNICK.

it is generally very fat, and it does not become emaciated by hibernating. It makes a nest of tangled or interlaced herbage opening from above, usually in copse or under-wood; and produces about four young ones at a birth. It often assumes a remarkable posture in feeding, suspending itself by its hind feet; more generally it sits upon its haunches, and holds its food in its fore-paws. This species is found in all parts of continental Europe, from the Mediterranean to Sweden.—The FAT D. (*M. Glis*) is a larger species, grayish brown, about the size of a rat, with tail very like that of a squirrel, native of the south of Europe, where it inhabits forests, leaping from branch to branch with great agility. It is eaten by the Italians, as it was by the ancient Romans, who highly esteemed it, and fattened it for the table in receptacles called *gliraria*.—The GARDEN D. (*M. nitela*), common in Europe as far n. as Poland, is frequently found in gardens, and even in out-houses. It is often very destructive of the fruit of wall and espalier trees. It is rather smaller than the Fat D., grayish brown, black round the eyes, and has the tail tufted only at the extremity. All the species of D. hibernate; and from this circumstance the name seems derived.

DORN, n. *dörn* [Ger. *dorn*; Dut. *doorn*, a thorn]: the fish thornback.

DORNBIRN, *dawrn'birn*: town of Austria, in the n.w. of Tyrol, about 8 m. s. of the e. extremity of the Lake of Constance; on the Lossen, a small mountain stream. The houses are widely scattered. The women of D. are chiefly employed in muslin-embroidery; the men are for the most part carpenters, engaged principally in the construction of wooden houses, which are carried in detached pieces to the market-town (Bregenz), and are thence exported. Pop. (1880) 8,263; (1890) 10,678.

DORNELL: see DARNEL.

DOR'NER, ISAAC AUGUST, D.D., theologian: 1809, June 20—1884, July 12; b. Neuhausen-ob-Eck, Württemberg; son of a Lutheran clergyman. He was educated at the Univ. of Tübingen, and was appointed prof. of theol. there 1838, at Kiel. Univ. 1839, Königsberg Univ. 1840, Bonn Univ. 1847, and Berlin Univ. 1857. In 1873 he came to the United States as a delegate to the meeting of the Evang. Alliance. His theol. writings, which are many and highly esteemed, include a *History of the Development of the Doctrine of the Person of Christ* (1839), *History of Pietism, especially in Württemberg* (1840), *The Principle of Our Church* (1841), *History of Protestant Theology, especially in Germany* (1867), *Christliche Glaubenslehre* (2 vols. 1880), *Gesammelte Schriften aus dem Gebiet der Systematischen Theologie, and Exegese und Geschichte*. Dr. D.'s theological learning was great, and his thought profound. He may be considered the ablest of recent upholders of evangelicalism in doctrine against the rationalism of Germany. His systematic works, greatly admired as a whole, have met earnest criticism in America on a few points of eschatology.

DORNICK, or DORNIC, *dawr'ník*, or DORNOCK, *dawr'nök*;

## DORNICLE—DOROGOI.

species of figured linen, for a full description of which see Ure's *Dict. of Arts and Manufactures*. Dornicks were formerly made in considerable quantity at Dornich, or Tournay, in the Netherlands; hence their name. From this place, the manufacture was probably carried to Norfolk by the Dutch, who emigrated thither during the persecution of the Duke of Alva. By a statute, 5 and 6 Ed. VI. c. 24, this manufacture, or 'mystery,' carried on at Norwich, is carefully protected. All persons, except those residing in Norwich or Pulham, are forbidden to carry on the 'mystery,' under pain of forfeiture of the article, and of the sum of 6s. 8d. for every six yards so made. By 4 Will. and Mary, c. 5, s. 2 (68), a duty of 10 per cent., in addition to duties previously levied, is laid on all tapestry or dornicks imported, except from France. These stringent provisions are no longer in observance.

**DORNICLE:** see **BLENNY**.

**DORNOCH**, *dawr'noch*: royal burgh and county town of Sutherlandshire, Scotland, near the entrance to the **DORNOCH FIRTH**—an inlet of the North Sea, running 25 m. inland, and separating Sutherland from Ross-shire. The cathedral stands in the centre of the town, and is an object of considerable attraction. It is said to have been begun in the 11th c. by St. Bar, and was enlarged 1270 by Bp. Gilbert Murray. It was burned 1570, and thereafter partially repaired. In 1837, it was to a certain extent restored by the late Duchess of Sutherland. It is in the shape of a cross, and is surmounted with a tower and clock spire. The interior is fitted up and used as the parish church. D. was, in olden times, the residence of the bishops of Sutherland and Caithness. The w. tower of the bishop's palace stands immediately opposite the cathedral. Next to it is a handsome building, in the old English style of architecture, for the courts of law and public offices. The town has a neat, clean appearance, and is lighted with gas. It is considered one of the best bathing-places in the north, and has extensive 'links,' fit for archery, golfing, and other exercises. D. is one of the six northern burghs which send a member to the house of commons. It was constituted a royal burgh by Charles I. 1628. The last victim in Scotland to the laws against witchcraft was burned here 1722. Pop. (1871) 625; (1881) 497; (1891) 541.

**DOROGH**, *dō-rōg'*: town of Hungary, 20 m. n.n.w. from Debreezin, in a very fertile district. The people are chiefly engaged in agricultural pursuits. Pop. 8,026.

**DOROGOBUSH**, or **DOROGOBOUGE**, *dō-rō-gō-bōzh'*: town of Russia, govt. of Smolensk; on the left bank of the Dnieper, about 50 m. e.n.e. of Smolensk. It is a small town, but pretty, and well built, and has some manufactures. At D., the French under Eugene, in their retreat from Moscow, encountered many disasters. Pop. (1890) 10,000.

**DOROGOI**, or **DOROHOOY**, *dō-rō-hō'ē*: town in the n. part of Moldavia, Roumania, on the Shiska river, a tributary of the Pruth, bet. 75 and 80 m. n.w. of Yassy. It is poorly



## DORONICUM—DORR.

built, does a large trade in the products of n. Europe, and has several annual fairs of local importance. Pop. (1885 est.) 10,000; (1890) 15,000.

**DORONICUM**, n. *do-rŏn'ĭ-kŭm* [Arab. *dorongi*]: in bot., leopard's-bane, genus of composite plants, belonging to the sub-order *Tubulifloræ*, sub-tribe *Senecioneæ*.

**DOROSMA**, *dō-rŏsh'mŏ*: town of central Hungary, Little Cumania, 6 m. w.n.w. of Szeged. It contains a Rom. Cath. high school. Pop. (1880) 10,652; (1890) 12,325.

**DORP**, *dawrp*: town in the govt. of Dusseldorf, Prussia, on the Wupper r.; annexed to Solignen 1889. Since 1849 it has become an important centre of manufacturing industry, owing largely to the vast coal deposits in its vicinity, and has extensive iron, steel, paper, and tobacco factories. Pop. (1872) 10,689; (1881) 11,999; (1897) est. 15,000.

**DORPAT**, *dawrp'pât*, or **DERPT**, *dĕrpt* (Russian, *Guriev*, Esthonian, *Tartolin*): town of Russia, govt. of Livonia; on the Embach, here crossed by a fine granite bridge, 150 m. n.e. of Riga. It is built in the form of a semicircle, and consists of a town proper, with two suburbs. Its streets are straight and clean; its houses, mostly of one story, are of brick or wood, have handsome fronts, and are often showily painted. It is the winter residence of the Livonian nobles and gentry. The Domberg Hill, at the n.w. extremity of the town, is tastefully laid out in avenues and promenades; its summit, formerly the site of a cathedral, destroyed by fire in 1775, is now occupied by an observatory, the university library, schools of anatomy and natural history, museums, etc. The observatory—one of the most renowned in Europe, and long presided over by the celebrated Struve—possesses a great refracting telescope, presented by the Emperor Alexander I. The university, founded 1632 by Gustavus Adolphus, suppressed 1656 by the Muscovites, and reestablished by Alexander I. 1802, is famous. It supports a staff of about 70 professors and lecturers, and is attended by between 800 and 900 students, of every religious denomination, who are taught theology, ethics, law, medicine, natural philosophy, and natural history. German is employed, except for law. It is also the chief school of the Prot. clergy in Russia, and the Reformed Synod of Wilna send their students hither. D. has a botanical garden, containing 18,000 plants, some of which are not possessed by any other botanical garden in Europe. D. was formerly a walled town, and the ramparts remain, but have been converted into public walks. The chief employment of the people is in supplying the wants of those connected with the university. Pop. (1880) 29,727; (1897) 45,000.

**DORR**, *dawr*, **JULIA CAROLINE RIPLEY**: b. Charleston, S. C., 1825, Feb. 13: author. She removed with her father to Rutland, Vt., while a child, married Seneca R. Dorr 1847, and became a contributor to magazine literature 1848, when she took a \$100 prize offered by *Sartain's Magazine* with her prose tale *Isabel Leslie*. Her prose and poetical works have since comprised *Farmingdale* (1854), *Lanmere* (1856), *Sibyl Huntingdon* (1869), *Poems* (1871). *Expiation*



## DORR—DORSAL.

(1872), *Friar Anselm, and other Poems* (1879), *Daybreak, and Easter Poem* (1882), *Bermuda* (1884), and *Afternoon Songs* (1885). An unauthorized publication of several of her essays was made under the title of *Bride and Bridegroom* (1873).

DORR, THOMAS WILSON: 1805, Nov. 5—1854, Dec. 27; b. Providence, R. I.: lawyer. He graduated at Harvard Univ. 1823, studied law with Chancellor Kent in New York, was admitted to the bar there, and returned to Providence to practice. He was elected a member of the assembly as a federalist 1833, procured passage of a bill curtailing the powers of the state banks, and endeavored vainly to secure the adoption of a more liberal constitution than the restrictive one based on the Charles II. charter and then in force, and became a democrat on leaving the assembly 1837. Failing officially in his new constitution movement, he organized a suffrage party (1840) which called a convention at Providence 1841, Oct. 4, when a constitution was framed. This was submitted to the popular vote in Dec., and received what was asserted to be a majority vote of the adult citizens of the state. Under this constitution Mr. D. was chosen gov. 1842, Apr. 18. A constitutional convention was also called by the legislature, but its draft was rejected by the people 1842, Mar. At the regular election under the old law, Samuel W. King was chosen gov. Both governors were inaugurated 1842, May 3, and their adherents immediately rushed to arms. Gov. King called out the militia and proclaimed martial law; Gov. D. attempted to seize the state arsenal, but was prevented by the militia; and in an appeal to the federal authorities Gov. King was recognized as the chief executive. Another convention called by the legislature adopted the present constitution Nov. 5, and its ratification by the people put an end to 'Dorr's rebellion.' Mr. D. was arrested, convicted of high treason, and (1844, June 25) sentenced to imprisonment for life; but was pardoned 1847, and restored to civil rights 1851.

DORRE ISLAND, *dawr*: north of Dirk-Hartog Island (q.v.) in lat. 25° 10' s. It is 20 m. long, and forms, like its southern neighbor, part of the breast-work of Shark Bay, in W. Australia.

DORSAL, a. *dōr'sāl* [F. *dorsal*—from L. *dorsālis*—from L. *dorsum*; It. *dorso*, the back]: pertaining to the back, as the *dorsal fin* of a fish. DORSIFEROUS, a. *-sīf'ēr-ūs* [L. *fero*, I bear]: in *bot.*, applied to ferns bearing fructification on the backs of their fronds. DORSIFIXED, a. *-fīkst* [*dorsum*, and *fixed*]: applied to anthers fixed to the filament by their backs, as in the tulip. DORSIP'AROUS same as DORSIFEROUS. DORSAL-SUTURE, n. *-sūt'yōr*, in *bot.*, a suture which faces the perianth of a flower, as opposed to the ventral suture which faces its centre. DORSAL VERTEBRÆ, n. in *anat.*, the vertebræ between the cervical and lumbar vertebræ. DORSAL-VESSEL, n. in *entom.*, in insects, a long blood-vessel or heart lying along the back, through which the nutritive fluid circulates. DORSI LUMBAR, n. *dawr'sī-*

## D'ORSAY—DORSETSHIRE.

*lūm-ber*, in *anat.*, pertaining to the loins and to the back. There is a dorsi-lumbar nerve. DORSI-SPINAL, n. *dawr'sī-spin'al*, pertaining to the back and the spine. DORSI-SPINAL VEINS, n. in *anat.*, veins forming a kind of network round the spinous, transverse, and articular processes and arches of the vertebræ. DORSO-CERVICAL, n. *-sēr'vī-kāl*, pertaining to the back of the neck. DORSO-INTESTINAL, a. *-īn-tēs'tī-nal*, in *anat.*, situated on the dorsal aspect of the intestines. DORSO LATERAL, a. *-lāt'ēr-al*, in *anat.*, connected with the side and with the back. There is a dorso-lateral muscle.

D'ORSAY, *dor-sā'*, ALFRED GUILLAUME GABRIEL, Count: 1801, Sep. 4—1852, Aug. 4; b. Paris: artist and fashion leader. His father was a gen. in the French army, in which he also served several years. In 1822, while on a visit to London, he became acquainted with Lord and Lady Blessington, and in 1827 married the daughter of the former by his first wife. Lord Blessington died 1829, and shortly afterward D'O. separated from the daughter and attached himself to the widow. He travelled extensively with her, and was her inseparable companion at Gore House, her famous London residence, as long as she lived. He was one of the handsomest men of his day, and possessed of brilliant talents, was equally noted as a leader in the fashionable life of London and Paris and as a painter and sculptor, and was appointed director of fine arts by Napoleon III. His widow married the Hon. Charles Spencer Cowper, and died 1869, Dec. 17.

DORSE, *dawrs*, or DORSET, or TORSK (from the Gothic *durren*, to dry, and anglicised *Tusk*): Norwegian names of the Cod (*Gadus callarias*), and formerly supposed to be a separate species, less in size than the cod, being seldom more than two ft. in length, but much resembles it in form and color, although its color is more variable, from which it has received the name of VARIABLE COD. It is called also the BALTIC COD. It differs from other cod in greater length of the upper jaw. It enters the mouths of large rivers. It is in great request on the coasts of the Baltic, being esteemed the best fish of all this family.

DORSEL, n. *dawr'sel* [L L. *dorsale*—from L. *dorsum*, the back]: a pannier; a basket or bag, one of which hangs on either side of a beast of burden for the reception of things of small bulk; a kind of woolen stuff used for hanging curtains, etc.; a canopy or screen of tapestry at the back of a throne or altar; tapestry or wall hangings round the sides of the chancel of a church; a dosel; a cover for a chair-back.

DOR'SET, EARL OF: see SACKVILLE.

DOR'SETSHIRE, *dawr'sēt-shēr*, or DORSET, *dawr'sēt*: maritime county in the south of England, on the English Channel, between Devonshire and Hampshire. Its greatest length is 58 m.; greatest breadth, 40; average 21; area, 627,265 acres. One-third is arable, a ninth waste, and the rest in pasture. The coast-line is 75 m. long, with some cliffs and headlands. St. Alban's Head is 344 ft. high.



## DORSIBRANCHIATE—DORT

Portland Isle (q. v.) is connected with the mainland by a remarkable formation known as Chesil Bank. The surface is uneven and bleak. Chalk downs run along the coast, and through the middle of the county nearly from e. to w. The highest point is Pillesden Pen, 134 ft. The chief rivers are the Stour and the Frome. Geologically, D. consists of strata of plastic clay, chalk, oolite, lias, with some weald and greensand. Remains of colossal reptiles have been found at Lyme Regis. The chief mineral productions are the celebrated Purbeck and Portland building-stones, coarse marble, and white china and pipe clays. The climate is mild. The chalk hills or downs are covered with short fine pasture, on which countless numbers of South-down sheep are fed. The soil is chiefly sand, gravel, clay, and chalk. D. is mainly a pastoral county, producing sheep, cattle, cheese, and butter; but some wheat, barley, hemp, linseed, hops, etc., are raised. Sanfoin is grown on the chalk hills. There are small manufactures of linen, silk, woollens, flax, hemp, buttons, stockings, and ale and cider. Since 1885, the county sends four members to parliament. The London and S.-western, and Somerset and Dorset railways run through Dorsetshire. D. has ancient British and Roman remains, as stone circles, cromlechs, barrows, camps, and amphitheatre, and three Roman stations. There are some remains of 40 abbacies, priories, hospitals, etc. The ruins of Corfe Castle, a seat of the Saxon kings of Wessex, are among the grandest in England. Pop. (1871) 195,537; (1881) 190,979; (1891) 194,487.

**DORSIBRANCHIATE**, a. *dŏr'sĭ-brăng'kĭ-ăt* [L. *dorsum*, the back; Gr. *branchia*, gills of a fish]: in *zool.*, having external gills attached to the back or sides: this word is of mongrel composition, and *notobranchiate* is the more correct term. This worm lives in sand or mud, and swims in the sea. One species, the Eunice, sometimes attains a length of 4 ft. Another species, the Lob-worm, is much used in Europe for fish-bait. See **INVERTEBRATE ANIMALS**.

**DORSTENIA**, n. *dawr-stē'nĭ-a* [named after Dr. T. *Dorsten*, a German botanist]: in *bot.*, genus of plants belonging to the nat. ord. *Urticaceæ*. The receptacle is slightly concave and broad, bearing numerous naked flowers. *D. contrayerva*, *D. Houstoni*, and *D. brasiliensis* furnish the *contrayerva* root of commerce. They are natives of tropical America. In pharmacy the rhizome is used as a stimulant, tonic, and diaphoretic: see **CONTRAYERVA**.

**DORSUM** n. *dŏr'sum* [L.]: in *scientific language*, the back; the ridge of a hill.

**DORT**, *dawrt*, or **DORDRECHT**, *dawr'dreĥt*: town of the Netherlands, province of S. Holland, on an island formed by the Maas, about 12 m. s.e. of Rotterdam. An inundation in 1421, in which upward of 70 villages were destroyed and 100,000 people drowned, separated the site upon which D. stands from the mainland. D. is fortified on the s. side, and its position is naturally so strong, that though frequently besieged, it has never been taken. It is



## DORTMUND—DORY.

one of the oldest towns in Holland, and some interesting historical particulars attach to it. Here, 1572, the states of Holland, after their revolt from Spain, held their first assembly, and declared the Prince of Orange the only lawful governor of the country. In 1618-9, the conclave of Prot. divines known as the Synod of Dort, met here, and condemned the doctrines of Arminius as heretical, and affirmed those of Calvin. (For an account of the questions at issue, see ARMINIUS.) The Gothic building in which the synod sat, whose miraculous labors, according to the president's closing address, 'made hell tremble,' was long used as a public-house, and the room in which they met as a dancing-saloon; the house has been destroyed. Among the principal buildings of D. are a Gothic church with a tall square tower and containing a beautiful marble pulpit, and the town-hall. The town is traversed by canals, and the Rhine and the Maas afford it great facilities for trade. Large ships can go quite up to the quays. Gigantic woodrafts, of value sometimes as much as \$150,000 each, obtained from the Black Forest and Switzerland, come down the Rhine to D., which has numerous saw-mills, ship building docks, salt and sugar refineries, bleacheries, and manufactures of tobacco, white-lead, etc. It has also considerable trade in corn, flax, oil, timber, and salt-fish. Pop. (1880) 27,292; (1889) 31,729.

**DORTMUND**, *dawrt'mûnt*: the most important town of Westphalia, on the Cologne and Minden railway, on the Emscher, 47 m. n.n.e. of Cologne. It is the centre of a mining district, with numerous foundries, and the headquarters of the mining authorities of Westphalia. D. was formerly surrounded by massive walls, but the greater part of these have been removed, and the town is now quite modern in aspect. Its history goes back into the earliest middle-age traditions. It figured in the time of Charlemagne under the names of Throtmanni, Tremonia, Trotmunde, and Dortmunde. Subsequently it became a free Hanse town, but was ceded to Prussia 1815, at the Congress of Vienna. The town-hall is one of the oldest in Germany. D. is an important railway-centre, and manufactures railway material on a large scale. Coal and iron are wrought in the neighborhood; and in D. are nearly 50 beer-breweries. Pop. (1880) 66,544; (1890) 89,663.

**DORTY**, a. *dawrt'î*: saucy; nice; delicate; tender; hard to rear or cultivate (said of plants).

**DORY**, n. *dō'rî* [etym. doubtful]: *naut.*, a small, sharp, flat-bottomed boat with very sloping sides, much used in fisheries.

**DORY**, *dō'rî*, or **DOREE**, n. *dō-rē'* [F. *dorée*—from *dorer*, to cover with gold]. (*Zeus*): a sea-fish of a golden-yellow color, popularly called in Eng. *John Dory*, or *doree*, being a corruption of the French *jaune dorée*, golden yellow. *Note*.—Latham suggests *janitore*, the gate keeper, a name given to it by the fishermen of the Adriatic, in allusion to St. Peter possessing the keys of heaven, the fish being called St. Peter's fish. In Skeat's opinion, *John* is not from F. *jaune*,

## DORYPHORA.

but is a mere sailor's expletive, and a familiar application of the personal name *John*, as is so often the case with *Jack*. The *D.* is a genus of fishes, type of a family, *Zenidæ*, sometimes regarded as merely a group of the great family of *Scomberidæ*, but at least a very distinct group, characterized not only by an oval and much compressed form of body, but also by a protractile mouth. The teeth are feeble. The species of *Zenidæ* are distributed in the seas of all parts of the world, though only three occur on the British coasts, and two of these are very rare (see BOAR-FISH and OPAH). In the *D.* genus, the general surface of the body is smooth and destitute of scales, but spiny scales or bony shields guard the dorsal and ventral edges. The anterior portion of the dorsal and anal fins are spiny, and are very distinctly



John Dory (*Zeus faber*).

separated from the spineless portions; the spines of the dorsal fin are prolonged into long filaments, and the tail-fin is rounded. The British species (*Zeus faber*), popularly known as the JOHN DORY, sometimes attains considerable size: Pennant mentions one which weighed 12 lbs; but it is seldom seen much more than 18 inches in length. It is found principally on the s. and particularly the s.w. coasts of England, visiting them, apparently, in pursuit of pilchards; but becomes more rare towards the north. It is highly esteemed for the table, having among modern epicures much the same reputation which it had among those of ancient Rome. It is common in the Mediterranean. The *D.* has a remarkable dark spot on each side. An idle legend refers these spots to the finger and thumb of St. Peter, and the *D.* thus disputes with the haddock the honor of being reputed the fish from whose mouth he took the tribute-money. Other species of *D.*, very similar to the European, are found in the seas of other parts of the world—one of them Australian, exhibiting similar dark spots.

**DORYPHORA**, n. *dōr-îf'ér-a* [Gr. *doruphoros*, bearing a spear—from *doru*, spear; *phoreo*, I bear, I carry]: in *entom.*, a genus of coleopterous insects (see COLORADO POTATO-BEETLE); in *bot.*, a genus of *Atherospermaceæ*. *D. sassafras* is the sassafras tree of New South Wales; a genus of



## DOSE—DOT.

marine *Diatomaceæ*, having valves furnished with transverse or slightly radially-dotted lines.

**DOSE**, n. *dōs* [F. *dose*—from Gr. *dōsis*, that which is given—from *didōmī*, I give]: the portion or quantity of medicine prescribed to be taken at one time; a portion; anything nauseous; what one is obliged to take: V. to give in portions or quantities, as medicine; to give anything nauseous, or to oblige to take. **Do'SING**, imp. **Dosed**, pp. *dōsd*. **DOSOLGY**, n. [Gr. *logos*, a discourse]: in *med.*, a treatise on doses of medicine and their administration.

**DOSEL**, or **DOSSELL**: see **DOSSE**R.

\* **DOSITHEANS**, *dō-sīth'ē-anz*: sect of Samaritans founded by Dositheus, said by some authorities to have been a companion of Simon Magus in the 1st c. after Christ, and by others to have been a disciple of John the Baptist. He presented himself as the prophet promised in Deut. xviii. 18, which passage the Samaritans believed was the only true Messianic prophecy ever given; and laid great stress upon the prescripts of the law, especially concerning the Sabbath. The sect, never large in numbers, was in existence in the early part of the 6th century.

**DOSS**, n. *dōs* [Flem. *dos*, dress array]: any ornamental knot, as a tuft of ribbons, flowers, hair, etc.: V. to make neat or spruce; to deck out: **ADJ.** neat; spruce. **Dossie**, n. *dōs'sī*, a neat, small, well-dressed person: **ADJ.** neat; spruce; active.

**DOSS**, n. *dōs* [Icel. *dos*, a box]: a box or pouch for holding tobacco.

**DOSS**, n. *dōs* [etym. doubtful]: a sleep; a bed.

**DOSS**, v.: to toss or attack with the horns; to pay down.

**DOSS**: see under **Dossil**.

**DOSSE**R, n. *dōs'sēr* [F. *dossier*, back of a seat—from F. *dos*; L. *dorsum*, the back]: a pannier or basket to be carried on the shoulder: **ADJ.** denoting the hangings placed at the back of the altar as a decoration, and to hide the bare walls; denoting hangings in a dining-hall behind the seats of the guests. **DORSALE**, n. *dōr'sāl*, **DOSEL**, n. *dōs'ēl*, or **Dos'SER**, n. *dōs-sēr*, a rich tapestry hanging at the back of an altar as an ornament, and to hide the wall; a hanging in a dining-hall; an ornamental cover for a chair; also **Dos'SAL**, n., and **DOSSEL**, n.

**DOSSIL**, n. *dōs'sīl* [F. *dousil*, a peg or tap to draw off liquor from a cask—the primary idea being a bunch of something to stop an orifice: Ger. *docke*, a bunch, also the tap of a fish-pond: Gael *dos*, a tuft, a cluster]: a small portion of lint made round, or in the form of a date, to be laid on a sore. **Doss**, n. *dōs*, a cushion stuffed with straw to kneel upon; a hassock.

**DOST**, v. *dūst*: 2d pers. sing. of the verb **Do**, which see.

**DOT**, n. *dōt* [Dut. *dodde*; Low Ger. *dutte*, a plug or stopper: Gael. *dād*, a small point: Scot. *dottle*, a small particle: other modifications of **Dot** are *jot*, *tot*, *iōtā*, *tait*]: a small point or spot made with a pen, etc.; any small point



## DOT—DOTTEREL.

or spot made with a pen, etc.; any small point or mark: V. to mark with small points. DOT'TING, imp. DOT'TED, pp. DOTTING-PEN, n. a pen having a roulette which makes dots or detached marks on the paper over which it is drawn.

DOT, n. *dōt* [F. *dot*, a dowry—from L. *dōtem*]: in *familiar language*, a dowry; a dotation: see DOTATION.

DOTAGE, DOTARD, DOTTARD, DOTTEREL, etc.: see DOTE.

DOTATION, n. *dō-tā'shūn* [F. *dotation*, an endowment—from L. *dotātiōnem*—from L. *dotātus*, endowed, portioned—from *dos*, a dowry, a gift]: endowment; establishment of funds for support, as of an hospital; a dowry or portion. DO'TAL, a. *-tāl*, pertaining to.

DOTCHIN, n. *dōch'in* [Chin.]: the Chinese steelyard. In Hong Kong and other parts where Europeans trade, the beams are doubly graduated with circles of brass pins to mark British and Chinese weights.

NOTE, v. *dōt* [Dut. *doten*, to be foolish, to rave; *dut*, sleep: F. *doter* for *radoter*, to dote, to rave: Icel. *dotta*, to nod the head in slumber]: to regard with excessive and foolish fondness; to show foolishness in the weakness of age. DO'TING, imp. DO'TED, pp.: ADJ. in *OE.*, stupid: see DOITED. DO'TER, n. one who. DO'TINGLY, ad. *-lī*. DOTAGE, n. *dō'tāj*, the childishness of age; feebleness of mind in old age. DO'TARD, n. *-tērd*, a man in the childishness of age. DO'TARDLY, ad. *-lī*. DOTTARD, n. *dōt'tērd* [Scot. *dottar*, to become stupid]: a standing tree in a state of decay. DOTTEREL, n. *dōt'tēr-ěl*, or DOT'TREL, n. a kind of sandpiper proverbial for stupidity.

DOTH, v. *dūth*: 3d pers. sing. pres. of Do 1, which see.

DOTHIDEA, n. *dō-thīd'ě-a* [Gr. *dothēn*, a small abscess; *eidos*, form]: in *bot.*, genus of *Sphæriacei* (ascomycetous fungi), often growing upon leaves. They are distinguished from *Sphæria* and the more closely allied genera by the ascus being contained in cavities in the stroma, without any distinct perithegium.

DOTIS, *dō'tish*, or TOTIS, *tō'tish*: town in the n.w. of Hungary, dist. of Komorn, 37 m. w.n.w. of Pesth. Between the town proper and its suburb, called *Lake Town*, from its situation on a small lake, are the remains of an old castle, said to have been a favorite residence of Mathias Corvinus, the Hungarian king. D. contains a splendid château, the property of the Esterházy family, the gardens adjoining which are laid out in the English fashion. Pertaining to this castle are some very extensive wine-vaults, one containing a tun capable of holding 34,700 English gallons. Pop. (1880) 6,507. (1890) 6,925

DOTTEREL, *dōt'tēr-ěl* (*Charadrius morinellus*): species of plover (q.v.), which in summer inhabits the n. parts of Europe and Asia, breeding chiefly in the highest latitudes, and migrates on the approach of winter to the countries around the Mediterranean and those of similar climate. It appears in Britain as a bird of passage, both on its northward migration in spring, and on its southward migration

## DOTTLE—DOUAY.

in autumn. Some breed in the mountains both of Scotland and of England, but only at considerable elevations. The D. is about nine inches and a half in its whole length. In summer plumage, the upper parts are of a brownish ash color, the feathers edged with deep red; the cheeks, throat, and a band above the eyes, white; the breast bright rust-color, with a white gorget on the upper part of it, bounded above by a blackish line; a conspicuous black patch on the middle of the belly; some of the tail-feathers tipped with white. The D. has become proverbial for stupidity; but



Dotterel (*Charadrius morinellus*).

the readiness with which it allows itself to be approached seems entirely owing to its coming from regions little frequented by man, and it becomes shy and watchful after a little experience. It is much esteemed for the table, and well known in the London market.

**DOTTLE**, n. *dŏt'tl* [Eng. *dot*, and dim. suf. *le*]: a little particle; the refuse of a pipe of tobacco.

**DOTTLE**, v. *dŏt'tl*: to be in a state of dotage; to move in a hobbling manner: **ADJ.** in a state of dotage or stupor; doting.

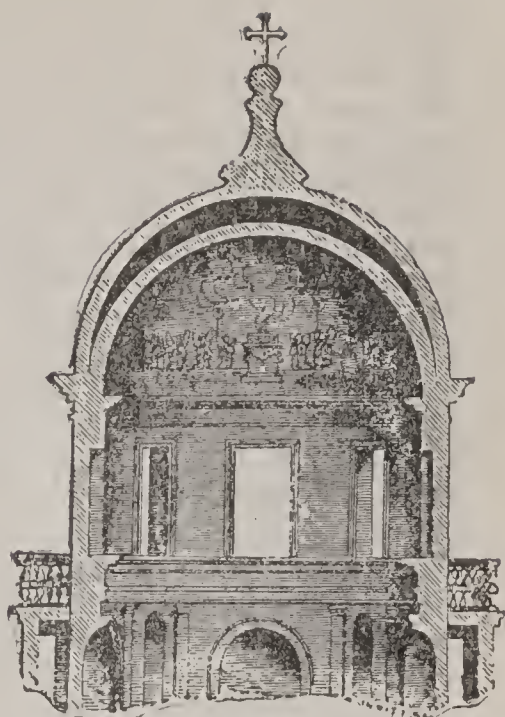
**DOUANIER**, n. *dŏ'ăn-ĩ-ă'* [F. *douanier*]: a French custom-house officer.

**DOUAY**, or **DOUAI**, n. *dŏ'ă* or *dow'ă*: town of France, department of Nord, on the river Scarpe, about 20 m. s. of Lille. Pop. (1891) 29,909. It is a dull, lifeless place, but surrounded with walls, and strongly fortified. The principal buildings are the churches, the Hotel de Ville, the public library, the museum, a hospital, and the old buildings of the English College. There are several good schools in D., and a great cannon-foundry. The manufactures include lace, tulle, cotton, oil, soap, brushes, iron machinery; and there is active trade in corn, seed, and linen. D. has existed since Roman times. It was long a bone of contention between the Flemish counts and the French rulers.

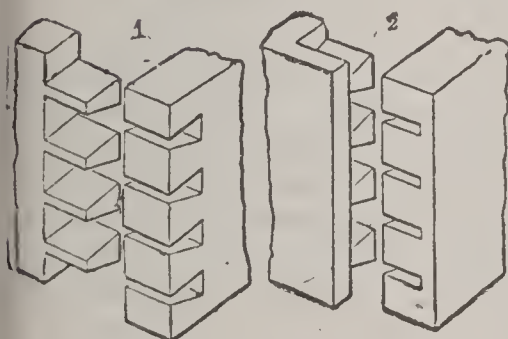




**Doorga.**—From Coleman's *Hindu Mythology*.



**Double-vaults,** dome of San Pietro in Montorio, Rome.



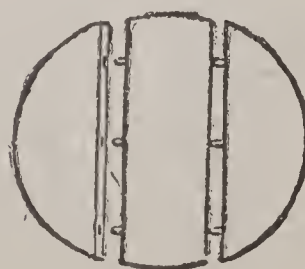
**1, Common Dovetailing; 2, Lap Dovetailing.**



**Dormer-window,** Oxford.



**Lion Dormant.**



**Dowel.**



## DOUAY—DOUB.

It passed with the rest of Flanders under the dominion of Spain, but was taken by Louis XIV. 1667. Marlborough captured it 1710, but the French re-occupied it after his withdrawal, and were finally confirmed in possession by the peace of Utrecht.—The *English Catholic College* at D., long the sole or chief theological seminary for English-speaking Catholics, was founded by Dr. William (afterward Cardinal) Allen, 1568. By reason of political difficulties with the Spanish authorities, then in possession of the town, the college was transferred to Rheims 1578; but in 1593 it was again established at D., and there it flourished till the French Revolution, when it was broken up. Subsequently it was re-established on a smaller scale by the Benedictine Fathers, and is still conducted by them.

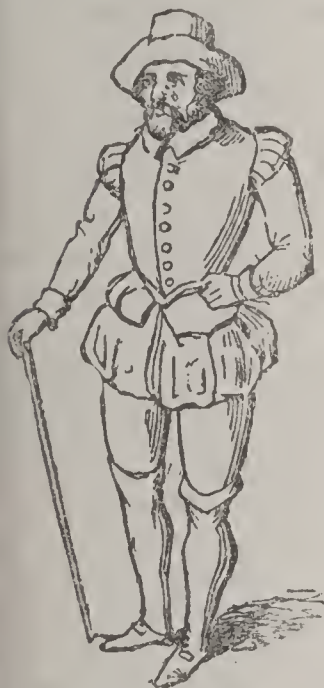
DOUAY, *dó-ā'*, FÉLIX CHARLES: 1816, Aug. 14—1879, May 4; b. Paris: French general. He entered the army as a private soldier when 15 years old, and was promoted sub-lieut. 1838, lieut. 1840, capt. 1843, lieut.col. 1853, col. 1856, gen. of brigade 1859, and gen. of division 1863. He served in the Crimean and Italian wars, was wounded at Solferino, commanded a brigade of the expeditionary corps sent to Mexico, and became aide de camp. to Napoleon III. and commander of the 1st div. of inf. in the army. At the beginning of the Franco-Prussian war he was in command of the 7th corps. He was among the officers surrendered at Sedan. After the signing of peace he returned to France, placed himself at the service of M. Thiers just before the insurrection, 1871, Mar. 18, organized an army to operate against the insurgents in Paris, took an active part in the second siege of the city, and was the first to enter it, May 21. He was appointed commander of the 6th corps 1873, and inspector gen. of the army 1879, Feb. Gen. D. received all the decorations of the legion of honor.

DOUAY BIBLE: see BIBLE.

DOUB, PETER, D.D.: 1796, Mar. 12—1869, Aug. 24; b. N. C.: clergyman of the Meth. Episc. Church, South. He was received into the Va. conference 1818, and travelled extensively through Va. and N. C. Few men were more successful in swaying the minds of the community and in leading converts into the church than he. In 1866 he became prof. of Biblical literature in Trinity College, N. C., and held the office till death.

## DOUBLE.

**DOUBLE**, a. *dūb'l* [F. *double*, double--from L *dūplus*, twice as much, double—from *dūō*, two; *plēō*, I fill]: twice as much; twofold; being in pairs; deceitful; acting two parts, that is, two lines of conduct, open and secret: V. to fold; to increase by adding an equal sum or quantity: N. twice as much; a fold; the same quantity or length repeated; a turn in running; a trick: AD. twice over. **DOUB'LING**, imp.: N. a fold; an artifice; a shift; act of sailing round a cape; the winding and turning of an animal hunted. **DOUBLED**, pp. *dūb'ld*. **DOUBLENESS**, n. *dūb'l-nēs*, state of



Doublet.

being double. **DOUB'LY**, ad. *-lī*. **DOUBLET**, n. *dūb'lēt* [F. *doublet*]: two; a pair; a man's inner garment; a waistcoat; originally a close tight-fitting garment lined or wadded, in folds or doubles for defense, the skirts reaching a little below the girdle—almost identical with the jerkin: the sleeves were sometimes separate and tied on at the arm. Doublet is also a fraudulent imitation of a precious stone. **DOUBLET**, in *optics*, an arrangement of lenses in pairs, invented by Wollaston. It consists of two plano-convex lenses having their focal lengths in the proportion of one to three, or nearly so, and placed at a distance determinable by experiment. Doublet is also an old game bearing some resemblance to backgammon. **DOUBLETTE**, n. in *mus.*, a compound organ stop, consisting of two ranks,

generally a twelfth and a fifteenth. **DOUBLE-ACTING BALING-PRESS**, one which has two boxes in which the material is compressed; sometimes a single follower acts upon them alternately, in other cases two followers act simultaneously. **DOUBLE-ACTING ENGINE**, an engine in which both motions of the piston are produced by the action of live steam, which bears upon the faces alternately. In contradistinction to single-acting, in which live steam is admitted to only one side of the piston, the weight of the pump rod or the pressure of the atmosphere giving the return motion. This form of engine was invented by Watt: see **STEAM ENGINE**. **DOUBLE-ACTING INCLINED PLANE**, inclined plane on which the loaded wagons, as they descend by their weight, pull up the empty wagons by means of a rope passing round a pulley or drum at the top of the inclined plane. **DOUBLE-ACTING PUMP**: see **PUMP**. **DOUBLE-ACTION**, n. in *mus.*, in a pianoforte movement, an arrangement of a jointed upright piece at the back end of the key, used to lift the hammer instead of the stiff wire or lifter of the single action. The piece is called a hopper, and engages in a notch on the under side of the hammer to lift it, but, escaping or hopping therefrom, allows the hammer to fall away immediately from the string. **DOUBLE-BACK-FALL**, n. in *mus.*, an ornament in old music. **DOUBLE-**

## DOUBLE.

**DANKED**, or **DOUBLE BENCHED**, a. *naut.*, applied to a boat which has two men to work the same oar, or has two opposite oars worked by rowers on the same bench. **DOUBLE-BAR**, n. in *mus.*, a sign formed of two single bars showing the end of a piece; the end of a movement of a work; the end of a portion to be repeated; the commencement of a change of key; the commencement of a change of time; the end of a line of words set to music, as in a hymn tune. **DOUBLE-BARRELLED**, having two barrels—applied to a gun. **DOUBLE BASS**, the lowest-toned musical instr. of the violin class. **DOUBLE-BASSOON**, n. in *mus.*, the deepest-toned instrument of the bassoon type; called also *Contrafagotto*. Its sounds are actually an octave below those written: see **BASSOON**. **DOUBLE-BEAD**, n. in *joinery*, two beads placed side by side and separated by a quirk. **DOUBLE-BEARING**, a. in *bot.*, producing twice in one season. **DOULE-BEAT**, n. an ornament of old music, consisting of a beat repeated. **DOUBLE-BEAT VALVE**, a valve so arranged that, on opening, it presents two outlets for the water. The double-beat valve is used for deep wells and for high lifts, such as the pumps of mines and water-works. **DOUBLE-BITING**, a. biting (cutting) with either edge; two-edged. **DOUBLE-BITTED AX**, n. an ax having two opposite bits or blades. It is an ancient form of battle-ax, being a favorite weapon with the Franks in the time of Clotaire (7th c.), and with the Danes in the time of Alfred the Great (9th c.). The double-bitted ax is found in the tumuli or barrows of N. America. **DOUBLE-BLOCK**, n. *naut.*, a block with two sheaves ordinarily placed in the same pin, but which rotate in separate interstices in the shell. Some double-blocks have the sheaves arranged one above the other. **DOUBLE-BODIED MICROSCOPE**, a microscope invented by Nachet, to enable several observers to view the same object simultaneously. **DOUBLE-BOOK**, n. book printed on half sheets. **DOUBLE-BOURDON**, n. in *mus.*, an organ-stop of 32 ft tone. On the manuals it rarely goes below middle C; on the pedals it extends, of course, through the whole compass. **DOUBLE-BREASTED**, a. applied to a coat or waist-coat either side of which may be lapped over or buttoned. **DOUBLE-CAP**, n. a flat (unfolded) writing or book paper, 17 × 27 inches. **DOUBLE-CHANT**, n. in *mus.*, a chant in two parts, each in two strains, the first of three and the second of four bars in length. **DOUBLE-CHARGED**, loaded with a double quantity of gunpowder. **DOUBLE-CHISEL**, n. a tool with two chisel-edges to cut the ends of a mortise simultaneously, while the chip extends into the depression between the bits. It is used in mortising sash bars for windows. **DOUBLE-CHORUS**, n. in *mus.*, a chorus for two separate choirs; the several themes may be distinct, or so constructed that united they form one harmony. **DOUBLE-CLASPING**, a. fastened with a double clasp. **DOUBLE-CLOTH LOOM**, one for weaving two sets of webs simultaneously. These may be connected at certain parts, and cut apart subsequently, and so form a series of undergarments. In another form the two webs are so knitted as to form a tube, being joined by their edges. At certain intervals, both webs are



## DOUBLE.

thrown into one flat web of double thickness, and then again separated, forming a tube as before. The completed web is then cut apart mid-length of the doubled portion, and also mid-length of the tubular portion, and the result is a number of bags with closed bottoms. **DOUBLE-COMPASS**, n. an instrument whose legs are prolonged each way beyond the joint, so that either pair may be used; when the legs on one pair are double the length of the others, it answers as a bisecting-compass. **DOUBLE-CONVEX LENS**, a lens both sides of which are convex, though they may differ in the radii of their curves. When the difference is as 6 to 1, it is a crossed lens. **DOUBLE-CORAL STITCH**, in *needlework*, an embroidery stitch much used in ticking work, and for ornamenting linen. **DOUBLE-COUNTERPOINT**, n. in *mus.*, a kind of artificial composition where the parts are inverted in such a manner that the uppermost becomes the lowermost, and *vice versa*; or, in other words, the art of making melodies grammatically convertible at certain intervals. **DOUBLE-CROCHE**, n., in *mus.*, a semiquaver. **DOUBLE-CROWN**, n. in *numis.*, an English gold coin, current in the early part of the 17th c. Its value was at first 10, afterward 11 shillings; in *print.*, a kind of paper, 20 × 30 inches, used for posters and bookwork. **DOUBLE-CURVATURE**, n. in *geom.*, a term applied to a line which curves in such a manner that all parts of it are not in the same plane. Examples, the rhumb line and the loxodromic curve. **DOUBLE-CUT FILE**, a file which has two rows of teeth, crossing each other at an angle, in distinction from the single-cut or float, which has but one row. **DOUBLE-CYLINDER PRESS**, in *print.*, a press with one form, and receiving paper from two cylinders. **DOUBLE-CYLINDER PRINTING-MACHINE**, a printing-press in which the form is placed on a flat bed, and the impression taken by two cylinders, each of which alternately takes a sheet and receives an impression from the form while it is passing under them. **DOUBLE-CYLINDER PUMP**: see **PUMP**. **DOUBLE DAGGER**, n. in *print.*, a reference mark next in order to the dagger; otherwise called a diesis. **DOUBLE-DEALING**, the profession of one thing and the practice of another; duplicity; deceit; dissimulation; fraud. **DOUBLE-DEMISEMIQUAVER**, n. in *mus.*, a note whose value is one-half of a demisemiquaver. **DOUBLE-DEMY**, n. in *print.*, a kind of paper, 35 × 22½ inches, used for posters and bookwork. **DOUBLE DIAMONDS**, n. a stitch made in Macramé lacc. **DOUBLE DIAPASON**, n. in *mus.*, an organ stop of 16 ft. pitch. **DOUBLE-DISTRESS**, n. in *Scots law*, a name given to those arrestments which are used by two or more creditors, in order to attach the funds of their debtor in the hands of a third party. **DOUBLE-D'OR**, n. a French style of jewelry; a plate of gold is soldered upon one of copper, the respective thicknesses being one and eleven; the plate is then thinned by rolling, and worked up into the required form. **DOUBLE-DRAWING PEN**, n. a draughtsman's pen to rule two lines at once. **DOUBLE-DRILL**, n. a drill with two cutters, making a countersunk hole so that the head of the screw or rivet placed therein shall not protrude. **DOUBLE-DRUM**, n. in *mus.*,

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a large drum beaten at both ends, in distinction from side, snare, and kettle drums. **DOUBLE-DUTCH**, *n.* gibberish; jargon, or some tongue not understood by the hearer. **DOUBLE-DYED**, *-did*, criminal in the highest degree; steeped in crime, as a double-dyed villain. **DOUBLE-EAGLE**, *n.* an American gold coin of the value of 20 dollars. **DOUBLE-EDGED**, that cuts either way, as a sword with two edges—that is, one having no back. **DOUBLE-ELEPHANT**, *n.* a size of drawing or flat writing paper, measuring 26 × 40 inches. **DOUBLE-ENTRY**, *n.* in *-bookkeeping*, a method of book-keeping in which every transaction is entered twice, one on the creditor side of one book, and again on the debtor side of another, so as to serve as a check on each other. **DOUBLE-FACED**, showing two faces; deceitful. **DOUBLE-FILE**, *n.* a compound file made of two files riveted together, one edge projecting beyond that of the other. Used by cutlers and gun-makers in checkering their work, as on the small of the gun-stock. **DOUBLE-FIRST**, *n.* in *univ.*, one who takes his degree in the first class, both in classics and in mathematics. **DOUBLE-FLAGEOLET**, in *mus.*, a flageolet having two tubes and one mouth piece, admitting of the performance of simple music in thirds and sixths, etc. **DOUBLE-FLAT**, *n.* a sign (*bb*) used in music before a note already flattened in the signature, which depresses the note before which it is placed another half tone. It is contradicted by a natural and a flat. **DOUBLE-FLOOR**, *n.* in *carp.*, a floor constructed with binding and bridging joists; a double-framed floor. **DOUBLE-FLOWERS**: see **FLOWER**.—**DOUBLE-FLUID BATTERY**, *n.* a galvanic battery in which two fluids are used as exciting liquids. They are kept apart by a porous cup, as in the Daniell's battery, or by gravity, as in Calland's. Daniell was the inventor of this form of battery, and received therefor the Copley medal of the Royal Soc. 1837. He used sulphuric acid in a porous cup placed in a glass cup containing sulphate of copper. **DOUBLE-FRONTED**, *n.* having two fronts; applied to a house, shop, etc., in which there are rooms and windows both sides of the entrance. **DOUBLE-FUGUE**, *n.* in *mus.*, a common term for a fugue on two subjects, in which the two start together. **DOUBLE-FURROW PLOW**, a plow striking two furrows at once; a gang or double plow. **DOUBLE-GEAR**, *n.* the nests of variable-speed gear-wheels in the headstock of a lathe; back-gear. **DOUBLE-GEAR WHEEL**, a wheel which has two sets of cogs of varying diameter; these may drive two pinions, or be driven by one and drive the other. **DOUBLE-GLOUCESTER**, *n.* a superior kind of rich cheese, of double thickness, manufactured in Gloucestershire, England. **DOUBLE-HALF-ROUND FILE**, same as cross-file. **DOUBLE-HAMMER**, *n.* in *metal.*, forging device for operating upon a bloom or puddler's ball, striking it upon opposite sides simultaneously. **DOUBLE-HANDED**, *a. lit.*, having two hands: *fig.* double-dealing; treacherous; deceitful. **DOUBLE-HEADED**, *a.* having two heads; in *bot.*, having the flowers growing one to another. **DOUBLE-HEADED RAIL**, a rail whose edges are bulbous and counterparts, so that when one is worn the other may be placed uppermost. This rail does not rest so



securely on the sleepers, having no flat base like the foot rail or bridge-rail, but requires a chair on each sleeper, greatly increasing the expense. **DOUBLE-HEADED SHOT**, in *ord.*, a projectile formerly used, consisting of two shot united at their bases. **DOUBLE-HEADED WRENCH**, a wrench having a pair of jaws at each end, one diagonal, the other right-angular. **DOUBLE HEARTED**, deceitful; treacherous. **DOUBLE-HUNG**, n. in *carp.*, a term applied to the sashes of a window when movable, the one upward and the other downward, by means of cords, weights, and pulleys. **DOUBLE-IMAGE MICROMETER**, suggested by Roemer about 1678; brought into use by Bonguer about 1748: a heliometer. **DOUBLE-IMPERIAL**, n. in *print.*, a kind of paper,  $32 \times 44$  inches. **DOUBLE-INSURANCE**, n. in *law, com.*, etc., the term applied when a person, being fully insured by one policy, effects another insurance on the same property with another office. In this case the law will allow him to be indemnified from one insurance or the other, but not to make a profit by claiming indemnification from both. Besides this, the office which meets his loss can claim part repayment from the other one. **DOUBLE-JOINTED COMPASS**, a compass having, in addition to the main joint, additional joints by which legs may be bent to secure a proper presentation of the feet to the paper. **DOUBLE-KNIFE**, n. a knife having a pair of blades which may be set at any regulated distance from each other, so as to obtain thin sections of soft bodies. One form of this is known as Valentin's knife, from the inventor. **DOUBLE-KNITTING**, n. in *needlework*, a stitch in knitting which, producing a double instead of a single web, is especially useful when light and yet warm articles are to be knitted. **DOUBLE-KNOTS**, n. in *needlework*, a knot used in tatted crochet. **DOUBLE-LEAF**, n. in *bot.*, *Listera ovata*, from its two opposite and only leaves. **DOUBLE-LETTER**, n. in *print.*, two letters on one shank, as *ff*, *fl*. **DOUBLE-LIGHT**, n. a variety of light as displayed for the warning and instruction of mariners from lighthouses. The light indicates land, rock, or shoal, and, by varying the characteristics of the light, the seaman is informed of the part of the coast he is on, and of his bearings as to his port or course. The other characters of light are known as Fixed, Revolving, Intermittent, Flashing, and Colored. These are variously combined. The double-light is usually exhibited from two towers, one of which is ordinarily higher than the other. The duplication of the lights affords a leading line as a guide to a channel, as well as furnishing another mode of varying the lights on a coast where they are numerous. **DOUBLE-LINE**, n. a form of driving-lines or reins in which supplementary reins are afforded, which may be brought into use in emergency, such as an attempt to bolt. In some cases it is an extra rein to pull the horses' heads together; a rein to pull a hood over the eyes of a horse; a gag-rein to pull the bit violently into the corners of his mouth; a choking-rein around the throat; a gripper on the muzzle; shutters on the nostrils, etc. A description of driving-reins or lines in which each main branch has a check-line to the bit of the other horse. **DOUBLE-LOCK**, n. a canal-lock having two parallel



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chambers connecting by a sluice. Each chamber has a gate at each end connecting with the upper and lower pounds respectively. The object is to save one-half the water that would be used in locking boats: V. to fasten a door by shooting the lock twice; to fasten with double or extra security and caution. DOUBLE-LONG, a. in *needlework*, a stitch used in crochet. DOUBLE-MARGIN DOOR, in *joinery*, a door framed in imitation of folding-doors, the central style being made double with an intervening bead. DOUBLE-MEDIUM, n. in *print.*, a kind of paper, 24 × 38 inches. DOUBLE-MILLED, a. in *cloth manufac.*, twice milled or fulled, to render more compact and fine. DOUBLE-MINDED, unstable; unsettled; wavering. DOUBLE-MOLDBOARD PLOW, in *agri.*, a plow having a moldboard on each side of the sheth, so as to throw the soil away right and left. It is used in hilling up crops, such as potatoes and cabbages, but not used for corn, the rows being too wide apart. DOUBLE-OCTAVE, n. in *mus.*, the interval of a fifteenth. DOUBLE PEDAL POINT, n. in *mus.*, a portion of a fugue or melody in which two notes are long sustained, generally the tonic and dominant. DOUBLE-PICA, n. in *print.*, a size of type double the size of small pica. DOUBLE-PILED FABRIC-LOOM, one in which a pile is formed on both sides of the foundation, and which may be produced from either the warp or weft. DOUBLE-PISTON PUMP, one which works two pistons from a single lever or handle. It may be double or single acting as to the separate pistons. DOUBLE PISTON-ROD ENGINE, a direct action steam-engine; said to afford the shallowest arrangement yet known, with no beam above deck, and is used on the Rhone, the Indus, and the Sutlej. DOUBLE-PISTON SQUARE-ENGINE, an engine having two square pistons at right-angles to and one within the other. DOUBLE-PLANE-IRON, n. in *carp.*, a smoothing-plane iron having a counter-iron to bend up the shaving in working cross-grained stuff. DOUBLE-PLEA, n. in *law*, a plea in which the defendant alleges for himself two several matters in bar of the action, whereof either is sufficient to effect his desire in debarring the plaintiff. DOUBLE-QUARREL, or DOUBLE-COMPLAINT, n. *eccl. law*, a complaint made by any clerk or other to the archbishop of the province, against an inferior ordinary for delaying justice in some cause ecclesiastical. And this seems to be termed a double-quarrel probably because the complaint is commonly made against both the judge and him at whose petition justice is delayed. DOUBLE-QUICK, n. in *milit.*, 165 steps of 33 inches each to be taken in one minute. If necessity requires, the steps may be increased to 180. It is, next to the run, the fastest time in marching. DOUBLE-REED, n. in *mus.*, the vibrating reed of instruments of the oboe class; a reed stop on an organ of 16-ft. pitch. DOUBLE RELISH, n. in *mus.*, an ornament in old music. DOUBLE-ROYAL, n. in *print.*, a kind of paper, 26 by 40 inches. DOUBLE-SALT, n. in *chem.*, a compound salt, consisting of two salts in chemical combination, as common alum, which contains sulphate of alumina and sulphate of potash. DOUBLE-SAW, n. a stock having two blades at a regulated distance, adapted to cut kerfs

and space the intervals, as in comb-cutting. **DOUBLE-SEAMING MACHINE**, a tool or machine for lapping the edges of sheet-metal one over the other, and then doubling over the lapped portions so as to prevent the portions slipping apart. **DOUBLE-SEAT VALVE**, perhaps another and more appropriate term for the double-beat-valve. **DOUBLE-SECURITY**, n. two securities held by a creditor for the same debt. **DOUBLE-SHARP**, n. in *mus.*, a sign (×) used before a note already sharp to indicate that it is desired to raise the pitch by a semitone. It is contradicted by a natural and a sharp. **DOUBLE-SHOTTED**, loaded with a double quantity of shot, augmenting the destructive power of ordnance. **DOUBLE-SHOVEL PLOW**, a plow for tending crops, having two small shovels on as many sheths. They are arranged a little distance apart, and one a little behind the other. The left-hand plow is a little in the rear when the right is specially engaged in working the crop. **DOUBLE-SHUFFLE**, n. a low dance. **DOUBLE-SPEED PULLEY**, n. a contrivance for giving what is termed double speed to the spindles of the self-acting mule. **DOUBLE-SQUARE**, n. in *needlework*, an embroidery stitch, also known as queen stitch. **DOUBLE-STANDARD**, n. in *economics*, a twofold standard of monetary value. It implies the existence of what is known as the Gold Standard on the one hand, and the Silver Standard on the other. Wherever the double-standard in its integrity is in use a creditor is bound to accept payment of any sum in coins of either of the metals, gold or silver, which the debtor may choose to tender. **DOUBLE-STARS**, n. in *astron.*, two stars so close to each other as to appear one to the naked eye. **DOUBLE-STOPPING**, n. in *mus.*, the stopping of two strings simultaneously with the fingers in violin playing. The practice was first suggested by John Francis Henry Biber in 1681, in a set of solos for a violin and a bass; one of these pieces is written in three staves, two for the violin playing in double stopping, and the third for the bass. He also in the same work suggests a varied tuning in fourths and fifths for the purpose of making the double-stopping easy. **DOUBLE SUPER-ROYAL**, in *print.*, a kind of paper, 27 × 42 inches. **DOUBLE-TANG FILE**, a file with a tang at each end, to adapt it to receive the handles. **DOUBLE-TONGUE**, v. in *mus.*, to play a passage with double tonguing; in *bot.*, the plant horsetongue. **DOUBLE-TONGUED**, a. self-contradictory in speech at different times; deceitful. **DOUBLE TONGUING**, n. in *mus.*, a peculiar action of the tongue against the roof of the mouth, used by flute players, to insure a brilliant and spirited articulation of staccato notes. The term is sometimes applied also to the rapid repetition of notes in trumpet and cornet playing. **DOUBLE-TRAVALE**, n. in *mus.*, a direction in tambourine playing. **DOUBLE-TREE**, n. the bar which is pivoted to the tongue of a carriage, wagon, or sled, or to the clevis of a plow or other implement. **DOUBLE-TRUMPET**, n. in *mus.*, an organ reed stop, similar in tone and scale to, but an octave lower in pitch than, the 8 ft. trumpet. **DOUBLE-VAULT**, n. in *arch.*, one vault built over another with a space intervening. Double-vaults are used in domes and



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domical roofs, the interior dome being of less altitude in order to harmonize with the proportions of the building internally. **DOUBLE-WARP**, n. in *fabrics*, a cotton cloth in which the warp and weft are of uniform size. **DOUBLE-WASTE**, n. in *law*, waste committed when a tenant, bound to keep a house in repair, allows it to be wasted, and then illegally fells timber to repair it. **DOUBLE WATER-WHEEL**, an arrangement of two water-wheels on one shaft, as in the case of a double-headed turbine, which has a wheel at each end of a horizontal shaft. **DOUBLE X** or **XX**, n. name given to porter or beer of more than ordinary strength; according to Palmer, a survival, in a somewhat disguised form, of the L. word *duplex* (misunderstood as double X). Thus, the fellows and postmasters of Merton College were forbidden by the statutes to drink *cerevisium duplex* or strong ale. **DOUBLER**, n. in *elect.*, instrument to increase the least conceivable quantity of electricity by continually doubling it, until it becomes perceptible upon a common electrometer or is made visible in sparks. It was invented by Bennet, improved by Darwin, and afterward by Nicholson: in *distill.*, a part of the still apparatus, or an appendage to a still in which the low wines, one of the products of the first distillation, are re-distilled. A part of the still is arranged to condense and then intercept and return the less volatile vapors, while those of greater tenuity pass on: in *manuf.*, a machine in which slivers, stricks, or filaments of wool, cotton, flax, or silk are laid together, to be drawn out and again doubled and drawn to remove inequalities, or, in the case of silk, to increase the thickness of the strand: in *calico print.*, a blanket or felt placed between the cloth to be printed and the printing-table or cylinder; a large dish or charger. **TO DOUBLE A CAPE**, to sail round it. **DOUBLE OR QUILTS**, in *betting or gambling*, when a winner lays down his stake, the loser promising to pay twice his stake if he loses again; if the loser wins the second throw he pays nothing—thus neither player loses or wins anything. **DOUBLING**, n. in *build.*, the double course of shingles or slates at the eaves of a house; in *distill.*, the second distillation of low wines. These are the product of the first distillation, and they contain about one fifth alcohol; in *cloth manuf.*, bringing two or more slivers of fibre together and forming them into one of greater thickness, to be again reduced by drawing, thus obtaining a sliver of uniform thickness: in *milit.*, the uniting of two ranks or files into one; the act of marching at the double: *naut.*, the act of passing or sailing round a headland; of *the bitts*, a piece of fir timber fitted on the back of the cross-piece; fir lining; of *a sail*, the double-seamed border for receiving the bolt-rope; the edging or skirt; in *ship-build.*, strakes of plank fastened on the outer skin of a ship; used as a fender against floating ice. **DOUBLING AND TWISTING MACHINE**, one by which a number of slivers of fibre are associated, drawn out, and partially twisted; or one in which strands are laid together and twisted into a thread or cord. **DOUBLING-FRAME**, n. in *silk manuf.*, a winding engine for double silk threads. **DOUBLING-NAIL**, n. a nail used in securing sheathing, lin-



## DOUBLE CONSCIOUSNESS.

ing, or supplementary covering to an object, such as the lining of gunports, etc. *Note.*—DOUBLE is very much used as the first part of a compound word, and denotes two ways; twice the number or quantity.

DOUBLE AVAIL OF MARRIAGE, in Scots Law: an old feudal custom which gradually acquired the force of law, by which a lord or other superior exacted from a vassal's son, unmarried at the time of his father's death, and who afterward married, not only the dower of the lady, which was called *single avail*, but considered himself entitled to choose a wife for the young man, and take from him *double avail*, or double dower, if he rejected the person chosen for him and married another.

DOUBLE CONSCIOUSNESS (or divided consciousness), likewise designated double personality: term comprehending a group of morbid mental conditions involving some modification in the clearness of the idea of personal identity. Persons are sometimes observed to have confused notions of the 'me' and 'not me;' others conceive that parts or properties of their frame belong to another person, or that they are inhabited and ruled by a spirit or entity acting in opposition to their will and interests; and there are others who in certain circumstances, such as when influenced by, or free from moral or physical stimulation, conceive that they are different persons, and endowed with different qualities and powers. These manifestations, however, do not fully illustrate the state under consideration, which has been described as exhibiting, in some measure, two separate and independent trains of thought, and two independent mental capabilities in the same individual, each train of thought and each capability being wholly dissevered from the other, and the two states in which they respectively predominate, subject to frequent interchanges and alternations. In the most marked or perfect form of this phenomenon, the individual is conscious of the two independent trains of thought, and conceives, in consequence of the apparent independence of these, that he is two distinct persons at the same time. There are few instances of this mental affection on record (see Wigan *On Duality of Mind*, Abercrombie's *Inquiry into Intellectual Powers*, Ellicot in Combe's *System of Phrenology*, 3d ed.). A servant-girl, at the period of puberty, gave evidence of double personality for three months. In an advanced stage of the affection, the occurrences during the paroxysm were completely forgotten by her when it was over, but were perfectly remembered during subsequent paroxysms. She was, for example, taken to church while in her abnormal state. She shed tears during the sermon, particularly during an account given of the execution of three young men, who had described, in the dying declarations, the dangerous steps with which their career of vice and infamy commenced. When she returned home, she recovered in a quarter of an hour, was quite amazed at the questions put to her about the sermon, and denied that she had been in church; but next night, when taken ill, she men-

tioned that she had been there, repeated the words of the text, and gave an accurate account of the tragical narrative of the three criminals by which her feelings had been so powerfully affected (*Philosophical Transactions*, Edin. 1822). This description assimilates the patient to the class of somnambulists. But such perversions of the faculties generally involve a more palpable and complete duality of mind. The personal identity seems lost or impaired. A. B. conceived that he was himself and another person at the same time; he acted as if this belief were sincere, and could not divest himself of the conviction that in his body were two minds or persons suggesting courses of conduct widely opposed. He was certain that his original self, A. B., was a base, abandoned scoundrel, tempting his other, or new, or better self—to whom, it should be noted, was attached the emphatic *Ego*—to commit crimes or acts of which he altogether disapproved. The second person in this duality repelled, struggled with these abominable solicitations, such as that he should commit suicide; and loathed the tempter or first person. This struggle sometimes became real and visible, when the hands, acting upon the will of No. 2, or the virtuous and opposing principle, beat and bruised the legs, body, or head, which, it may be presumed, were supposed to belong to No. 1, the vicious or tempting impulse. The object of the one was obviously to inflict pain upon the other. The blows were so severe as to leave marks for days; and when these were adverted to, the answer was, as if from No. 2: 'Don't justify him, he deserved it.' Such conflicts usually occurred during the night, and the interference of the night-watch was required to part or pacify the combatants (Fifth Annual Report, Crichton Royal Institution, 1844, p. 13). In this case the manifestations of disease might be attributed to the abstruse but vain philosophical inquiries of the mind during health.

While it is quite intelligible that habits of protracted self-analysis, or of that abstraction which loses all idea of distinct personality in the act of thinking, or in the subject occupying attention, may induce such a condition, a more physical explanation has been sought in the alternate morbid activity of different parts of the brain, in the non-consentaneous or independent and alternate activity of the two hemispheres of the brain, which, when acting together, are held to be the organ of the mind in its unity and entireness. Latterly, the views of Sir William Hamilton have been brought to bear upon the point; and still more recently, the theory called 'unconscious cerebration,' which supposes certain impressions to exist unperceived, and to become objects of consciousness only under certain conditions, has been applied to the same purpose; but, so far as the impairment of the conviction of personal identity is concerned, the problem still awaits solution.

DOUBLEDAY, *dūb't dā*, ABNER: b. Ballston Spa, N.Y.: 1819, June 26—1893, Jan. 26; officer U. S. A. He studied civil engineering and practiced it 1836-38, entered the U. S. Milit. Acad. the latter year, graduated and was assigned



## DOUBLE ENTENDRE—DOUBLING THE CUBE.

to the 3d. artil. 1842. He served through the Mexican war in the 1st artil., was promoted 1st lieut. 1847, Mar. 3, capt. 1855, Mar. 3; and after taking part in the Seminole campaign, 1856-58, was ordered to Fort Moultrie, Charleston harbor, 1860. With its garrison he withdrew to Fort Sumter 1860, Dec. 26, and when the latter was fired upon by the Confederates 1861, Apr. 12, Maj. Anderson permitted him to aim the first gun in the vain defense. For his gallantry on this occasion he was promoted maj. and assigned to the 17th inf. 1861, May 14; was in command of the forts and batteries on the Potomac during the autumn and winter 1861; and was promoted brig.gen., and given command of all the defenses of the national capital, 1862, Feb. 3. He took part in the second battle of Bull Run as commander of a div.; took six battle-flags at Antietam; was promoted maj.gen. of vols. 1862, Nov. 29; and, after serving at Fredericksburg and Chancellorsville, succeeded to the command of the 1st corps. At Gettysburg he supported Gen. Buford's cav., and commanded the field after Gen. Reynolds's death till Gen. Howard's arrival. When the Confederates under Gen. Early threatened Washington, 1864, July, Gen. D. was recalled to its defense. In 1865, Mar., he was brevetted col. U. S. A., and brig.gen. and maj.gen. for his distinguished services during the war; and 1867, Sep., was appointed col. of the 35th inf. He subsequently commanded various posts till 1873, Dec. 11, when he was retired from active service. Gen. D. is author of *Reminiscences of Forts Sumter and Moultrie in 1860-1* (1876), and *Chancellorsville and Gettysburg* (1882).

**DOUBLE ENTENDRE**, *dó'bl ǎng-tǎng'dr* [F.]: double meaning; a play on words, in which the word or phrase is capable of more than one sense; the correct French form is **DOUBLE ENTENTE**, *dó'bl ǎng-tǎngt'*, of which the full expression is **MOT À DOUBLE ENTENTE**, *mō á dó'bl ǎng-tǎngt'*, a word with a double meaning, and that meaning generally in a bad sense.

**DOUBLE FLAT**: musical character used to lower the note before which it is placed two half-tones.

**DOUBLE SHARP**: musical character, the reverse of the double flat.

**DOUBLE STARS**, or **BINARY STARS**: see **STARS**.

**DOUB'LINGS**: heraldic term for the linings of robes or mantles, or of the mantlings of achievements: see **MANTLING**.

**DOUB'LING THE CUBE**: celebrated geometrical problem among the ancients. The object was, to find the side of a cube whose content should be twice that of another given cube; and various accounts are given of how the problem was suggested. One legend brings the matter into connection with Delos (hence the name of 'the Delian problem'), and relates that the oracle of Apollo in that island, being consulted by the inhabitants during the prevalence of a pestilence, gave for answer, that they should make the altar of Apollo, which was in the form of a cube,



## DOUBLOON—DOUBT.

as large again. This was done, and yet the pestilence continued; and the oracle being again consulted, replied, that the altar must retain its cubic form, which had not been attended to in the enlargement. This problem perplexed the Delians, as it did mathematicians of after ages. Even Plato, whom they consulted on the difficulty, could give them no solution, and had recourse, according to the story, to evasion.

The problem, however, is older than Plato; before his time, it had occupied Hippocrates of Chios (not the physician Hippocrates), and was studied afterward by Eratosthenes, Nicomedes, Hero, and others. Apollonius applied conic sections to the solution of the question, as did also Menæchmus; Nicomedes invented a curve, which he called the conchoid, for the express purpose, and Diocles the cissoid. The analytical method introduced into geometry by Descartes showed this problem in its true light. It was seen to be only a special case of the solution of a cubic equation—a solution impossible by geometry, i. e., by the use of the circle and straight line. It may, however, be represented by the intersection of two conic sections, of which one may be a circle. Descartes made use of the parabola with the circle, which is the simplest way. With numbers, the question is merely one of the extraction of the cube root. If the side of a cube be one foot, its solid content is  $1 \times 1 \times 1 = 1$  cubic foot. The side of a cube of double that content, or 2 cubic feet is  $\sqrt[3]{2} = 1.259921$ .

DOUBLOON, n. *dūb-lōn'* [F. *doublon*—from Sp. *doblon* (see DOUBLE)]: gold piece coined in Spain and Spanish America; used also in Portugal; the double of the pistole. The Dublon de Isabella, coined since 1848, is of 100 reals, and equivalent to 25.84 French francs, or 20s. 8d.; abt. \$5.00. The older Spanish doubloons vary in value from 85 to 81 francs.

DOUBS, *dó*: dept. of France, on the e. frontier, separated from Switzerland by the Jura Mountains, lat. 46° 35'–47° 31' n., long. 5° 42'–7° 4' e.; 2,018 sq. m. D. is traversed by the river Doubs, a tributary of the Saone, and is separated, on the n.w., from the dept. of Haute Saone by the Oignon, also a tributary of the Saone. The surface is hilly, being crossed by four parallel ranges of the Jura Mountains. The climate is more rigorous than in most similar latitudes. The pine and the walnut attain a huge size, and the common orchard trees thrive well. Maize, potatoes, hemp, and flax are raised. The pasturage is excellent, and rears good breeds of horned cattle and horses, which are exported. In the valleys, great quantities of butter and cheese are produced. The rivers are well stored with fish. Mines of iron and coal are worked, and gypsum and marble are abundant. The trade is principally in iron, cattle, horses, and dairy produce. D. is divided into the four arrondissements, Besançon, Baumeles-Dames, Montbelliard, and Pontarlier. Cap., Besançon. Pop. of D. (1881) 308,482; (1891) 303,081; (1901) 298,864.

DOUBT, n. *dowt* [F. *douter*; prov. F. *dubtar*, to doubt

## DOUCE—DOUGHTY.

—from L. *dubitāre*, to waver, to fear—from L. *dubiūs*, doubtful, what may turn out in two ways]: uncertainty of mind; suspense; suspicion; fear; apprehension: V. to hesitate; to waver in opinion; to suspect; to fear; to hesitate to believe; to be in a state of uncertainty of mind DOUBT'ING, imp.: N. scruple; perplexity. DOUBT'ED, pp. DOUBT'ER, n. one who. DOUBT'FUL, a. -fŭl, uncertain; obscure; not clear or obvious; undetermined; suspicious. DOUBT'FULLY, ad. -lŭ. DOUBT'FULNESS, n. in a state of suspense or uncertainty. DOUBT'INGLY, ad. -lŭ DOUBT'LESS, ad. -lēš, without doubt; unquestionably. ADJ. free from fear. DOUBT'LESSLY, ad. -lŭ, unquestionably.—SYN. of 'doubt, v.': to scruple; waver; fluctuate; demur; question; suspect; dissent; apprehend;—of 'doubtful': dubious; wavering; hesitating; undetermined; equivocal; ambiguous; questionable; hazardous; distrustful; problematical; precarious.

DOUCE, a. dós [F. *doux*; OF. *dous*, sweet, soft—from L. *dulcis*, sweet]: in *OE.*, *Scot.*, and *prov. Eng.*, sedate; sober; prudent; not light and frivolous. DOUCELY, ad. dós'lŭ, soberly; sedately; modestly. DOUCENESS, n. dós'ness, sobriety; sedateness; decency.

DOUCE, v. dós: in *OE.*, *Scotch*, and *prov. Eng.*, to strike, to hit, to knock: N. a stroke; a blow.

DOUCEUR, n. dú-sér' [F. *douceur*, sweetness—from mid. L. *dulcōrem*, sweetness: F. *doux*, sweet—from L. *dulcis*, sweet]: a gift for service done or to be done; a bribe; a honorarium.

DOUCHE, n. dōsh [F. *douche*—from It. *doccia*, a mill-dam; *docchiare*, to let water run with some force on the head to clean and wash it]: a bath given by a jet or stream of water directed with considerable force upon some part of the body: see BATH: HYDROPATHY.

DOUCINE, n. dō'sēn: in *arch.*, a molding concave above and convex below, serving as a cymatium to a delicate cornice; a gula.

DOUGH, n. dō [AS. *dah*; Icel. *deig*, properly damped flour, dough; *deigia*, to wet: O.H.G. *daha*, clay: Goth. *deigan*, to mold in plastic materials]: a soft, moistened mass of flour and yeast kneaded; bread before being baked in an oven (see BREAD). DOUGHY, a. dō'ŷ, soft like dough. DOUGH-FACED, weakly and sickly looking; cowardly. DOUGH NUT, a small cake boiled in lard. MY CAKE IS DOUGH, my undertaking has proved unsuccessful.

DOUGHTY, a. dōr'tŭ [AS. *dohtig*, valiant: Dut. *deugen*, to be of some value: Goth. *dugan*, to avail: Ger. *taugen*, to be good for]: brave; valiant; noble; often used banteringly. DOUGH'TINESS, n. -nēs, valor; bravery. DOUGH'TILY, ad. -lŭ.

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DOUGLAS: modern capital and principal seaport of the Isle of Man, in the Irish Sea; so called from being near the junction of two streams—the *Dhoo* (black) and *Glass* (gray). D. lies on the margin of a highly picturesque bay, on the e. side of the island. From the excellence of the sea-bathing, and its central position, it has become highly popular as a watering-place. The old town, on the s. w. edge of the bay, consists of narrow tortuous streets, and presents a vivid contrast to the handsome modern terraces and villas which occupy the rising ground beyond. D. has an excellent landing pier; another pier and breakwater, constructed of concrete cement blocks, was opened 1879; the new street and charming promenade following the line of the bay is one of its most agreeable features. Conspicuous in the centre of the crescent of the bay stands Castle Mona, formerly the residence of John, Duke of Athol, now a first-class hotel. The Tower of Refuge, a picturesque object, occupies a dangerous rock, in the southern area of the bay, called Conister, and was erected 1833 for the safety of shipwrecked mariners, by the late Sir William Hillary, Bart., who, during his residence at D., founded the Royal National Life-boat Institution. D. is the principal packet station of the island, with a daily service of steamers during the summer months, and has telegraphic communication with England. Pop. (1881) 15,719; (1889) 20,000.

DOUGLAS, FAMILY OF: ancient Scottish family. Archaeology has failed in its efforts to pierce the obscurity which veils the origin of the family of D. A legend of the 16th or 17th c. told how, about 770, a Scottish king, whose ranks had been broken by the fierce onset of a Lord of the Isles, saw the tide of battle suddenly turned by an unknown chief; how, when the victory was won, the monarch asked where was his deliverer; how the answer ran in Erse, *Sholto Du-glas* ('Behold that dark-gray man'); and how the warrior was rewarded with that Clydesdale valley which, taking from him its name of Douglas, gave surname to his descendants. This fable has long ceased to be believed. Equal discredit has fallen on the theory which, 60 years ago, the laborious George Chalmers advanced in his *Caledonia*, that the Douglasses sprang from a Fleming of the name of Theobald, who, between 1147 and '64, had a grant of lands on the Douglas Water from the Abbot of Kelso. There is no trace of any connection between the Flemish Theobald and the Douglasses; nor were the lands which he acquired on one side of the stream any part of their old domain on the other. What was boasted of the Douglasses by their historian, two centuries ago, therefore still holds true. 'We do not know them in the fountain, but in the stream; not in the root, but in the stem; for we know not who was the first mean man that did by his virtue raise himself above the vulgar.' It was thought likely, in the beginning of the 15th c., that the Douglasses and the Murrays had come of the same stock, and in this old conjecture all that is known on the subject must still be summed up.



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1. WILLIAM OF DOUGLAS, first of the family who appears in record, was so called, doubtless, from the wild pastoral dale which he possessed. He is found witnessing charters by the king and the Bishop of Glasgow between 1175 and 1213. He was either the brother or the brother-in-law of Sir Freskin of Murray, and had six sons, of whom Archibald, or Erkenbald, was his heir; and another, Brice, a monk of Kelso, rose to be Prior of Lesmahago (a dependency of Kelso, on the outskirts of Douglas-dale), and in 1203 was preferred to the great bishopric of Murray. Brice owed this promotion, no doubt, to the influence of his kinsmen the Murrays, and it contributed not a little to the rising fortunes of his own house. He was followed beyond the Spey by four brothers, of whom one became sheriff of Elgin; another became a canon of Murray; a third, who had been a monk of Kelso, seems to have become Archdeacon of Murray; and a fourth, who had been parson of Douglas, appears to have become Dean of Murray.

2. SIR ARCHIBALD, OR ERKENBALD, OF DOUGLAS is a witness to charters between 1190 and 1232. He attained knighthood, and beside his inheritance of Douglas, held the lands of Hailes, on the Water of Leith, from the monks of Dunfermline, and had a grant of the lands of Levingston and Hirdmanston from the Earl of Fife. He is said to have acquired other lands in Clydesdale by his marriage with one of the two daughters and heiresses of Sir John of Crawford.

3. SIR WILLIAM OF DOUGLAS, apparently son of Sir Archibald, figures in record 1240-73. He appears 1255 as one of the Scottish partisans of King Henry III. of England; and in 1267 is found in possession of the manor of Fawdon, Northumberland, by gift of the king's son (afterward Edward I.). He seems to have had a brother, Sir Andrew, progenitor of the Douglasses of Dalkeith and Morton, and certainly had two sons.

4. HUGH OF DOUGLAS, the elder, acquired land in Glen-corse, Lothian, by marriage with the sister of Sir Hugh of Abernethy; and dying without issue about 1287, was succeeded by his younger brother.

5. SIR WILLIAM OF DOUGLAS, distinguished in the family traditions as *William the Hardy*, had all the daring and restless spirit characteristic of his descendants. His first appearance is in 1267, when his head was nearly severed from his shoulders in defending his father's English manor from a foray of the men of Redesdale. Twenty years later, he is found at the head of an armed band, carrying off his future wife, a wealthy widow, Alionora of Lovaine, from the manor of her kinsfolks, the La Zouches, et Tranent, Lothian. We hear of him immediately afterward as spoiling the monks of Melrose, deforcing the king's officers in the execution of a judgment in favor of his mother, unlawfully imprisoning three men in his castle of Douglas, and beheading one of them. He was the first man of mark who joined Wallace in the rising against the English 1297; and for this his lands of Douglas were

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wasted with fire and sword, and his wife and children carried off, by Robert Bruce, the young Earl of Carrick, then a partisan of England. But the Knight of Douglas soon left the insurgent banners, and submitting to his old patron, King Edward I., to whom he had again and again sworn fealty, was sent prisoner to the castle of York, where he died about 1302. It appears that he possessed lands in one English, and in seven Scottish counties—Northumberland, Berwick, Edinburgh, Fife, Lanark, Ayr, Dumfries, and Wigton.

6. THE GOOD SIR JAMES OF DOUGLAS, son of Sir William, is familiar in history, as Bruce's greatest captain in the long War of the Succession. The hero of 70 fights, he is said to have won them all but 13, leaving the name of 'the Black Douglas'—so he was called from his swarthy complexion—as a word of fear by which English mothers stilled their children. He was slain in Andalusia 1330, on his way to the Holy Land with the heart of his royal master, and dying unmarried, was succeeded by his brother, Hugh.

7. HUGH OF DOUGLAS, was brother of the Good Sir James. Of him nothing is known except that he made over the now great domains of his family 1342, to his nephew, *Sir William of Douglas* (son of a younger brother of the Good Sir James—Sir Archibald of Douglas, Regent of Scotland, slain at Halidon Hill, 1333).

EARLS OF DOUGLAS.—Hitherto, the Douglasses had no higher title than that of knight; but in 1357, *Sir William of Douglas*, who had fought at Poitiers, and distinguished himself in other fields, was made Earl of Douglas, and afterward by marriage became Earl of Mar. His ambition aimed at still greater things, and in 1371 he disputed the succession to the Scottish crown with Robert II. (the first of the Stewarts). He claimed as a descendant of the Baliols and Cummings; and his pretensions were abandoned only on condition that his son should marry the king's daughter. He died 1384. His son *James, second Earl of Douglas and Mar*, the conqueror of Hotspur, fell at Otterburn 1388; and as he left no legitimate issue, the direct male line of William the Hardy and the Good Sir James now came to an end. His aunt had married for her second husband one of her brother's esquires, James of Sandilands, and through her *Lord Torphichen* is now the heir general and representative at common law of the House of Douglas.

The earldom of Douglas, meanwhile, was bestowed on an illegitimate son of the Good Sir James—*Archibald, Lord of Galloway*, surnamed the Grim. By his marriage with the heiress of Bothwell, he added that fair barony to the Douglas domains; and having married his only daughter to the heir-apparent of the Scottish crown, and his eldest son to the eldest daughter of the Scottish king, he died 1401. His son and successor, *Archibald, fourth Earl of Douglas*, was, from his many misfortunes in battle, surnamed 'The Tyne-man,' i. e., the loser. At Homildon, 1402, he was wounded in five places, lost an eye, and was taken prisoner by Hotspur. Next year, at Shrewsbury, he felled the English king to the earth, but was again wounded and taken pris-



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oner. Repairing to France, he was there made Duke of Touraine, and fell at Verneuil 1424. He was succeeded by his son *Archibald*, who distinguished himself in the French wars, and dying 1439, was buried in the church of Douglas, where his tomb remains, inscribed with his high titles of 'Duke of Touraine, Earl of Douglas and of Longueville, Lord of Galloway, Wigton, and Annandale, Lieutenant of the King of Scots.' His son and successor, *William*, a boy of 16 years, is said to have kept a thousand horsemen in his train, to have created knights, and to have affected the pomp of parliaments in his baronial courts. His power and foreign possessions made him an object of fear to the Scottish crown; and, having been decoyed into the castle of Edinburgh by the crafty and unscrupulous Crichton, he was, after a hasty trial, beheaded with his brother, within the walls of the castle, 1440. His French duchy and county died with him; his Scottish earldom was bestowed on his grand-uncle (second son of Archibald the Grim), *James*, surnamed the Gross, who in 1437 had been made Earl of Avondale. He died 1443, being succeeded by his son *William*, who, by marriage with his kinswoman (only daughter of Archibald, fifth Earl of Douglas, and second Duke of Touraine), again added the lordship of Galloway to the Douglas possessions. He was, for a time, all-powerful with King James II., who made him lieut.gen. of the realm; but afterward losing the royal favor, he seems to have entered into a confederacy against the king, by whom he was killed in Stirling Castle, 1452. Leaving no child, he was succeeded by his brother *James*, who, 1454, made open war against King James II., as the murderer of his brother and kinsman (the sixth and eighth Earls of Douglas). The issue seemed doubtful for a time, but the Hamiltons and others being gained over to the king's side, Douglas fled to England. The struggle was still maintained by his brothers, *Archibald*, who by marriage had become Earl of Murray, and *Hugh*, who in 1445 had been made Earl of Ormond. They were defeated at Arkinholm, 1455, May, Murray being slain on the field, and Ormond taken prisoner, and afterward beheaded. Abercorn, Douglas, Strathaven, Thrieve, and other castles of the Douglasses, were dismantled; and the earldom of Douglas came to an end by forfeiture, after an existence of 98 years, during which it had been held by no fewer than nine lords. The last earl lived many years in England, where he had a pension from the crown, and was made a knight of the Garter. In 1484, he leagued himself with the exiled Duke of Albany to invade Scotland. He was defeated and taken prisoner at Lochmaben, and, on being brought to the royal presence, is said to have turned his back upon the king. The compassionate James III. spared his life, on condition of his taking the cowl. 'He who may no better be, must be a monk,' muttered the old man, as he bowed to his fate. He died in the abbey of Lindores, 1488, April; and so ended the elder illegitimate line of the Douglasses.

EARLS OF ANGUS.—Meanwhile a younger illegitimate branch had been rising to great power. *William*, first Earl



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*of Douglas*, was the faithless husband of a faithless wife. She was believed to have had a paramour in Sir William Douglas of Liddesdale. Her jealous husband, who slew that 'flower of chivalry,' had himself shared the affections of the wife of his wife's brother, Margaret Stewart, Countess of Angus and Mar. The issue of this amour, which in that age was accounted incestuous, was a son *George*, who in 1389 had a grant of his mother's earldom of Angus; married, 1397, the youngest daughter of King Robert III.; was taken prisoner at Homildon 1402, and died of the plague in England in the following year. He was succeeded by his son *William*, who, dying 1437, was succeeded by his son *James*, who died without issue, when the title reverted to his uncle. *George, fourth Earl of Angus*, took part with the king against the Douglasses, 1454; his loyalty was rewarded by a grant of their old inheritances of Douglasdale; and so, in the phrase of the time, 'the Red Douglas'—such was the complexion of Angus—'put down the Black.' He died 1462, being succeeded by his son *Archibald*, surnamed Bell-the Cat, sometimes called also the Great Earl. After filling the highest offices in the state, and adding largely to the family possessions, he retired to the priory of Canons Regular at Whithorn, in Galloway, where he died 1514. Having outlived his eldest son, he was succeeded by his grandson, *Archibald*, who, 1514, married the Queen-dowager of Scotland, Margaret, sister of Henry VIII. of England, and widow of James IV. of Scotland. The fruit of this marriage was a daughter, *Margaret*, who, marrying the Earl of Lennox, became the mother of Henry, Lord Darnley, who was husband of Queen Mary, and father of King James VI. The Earl of Angus had for a time supreme power in Scotland, but in 1528, the young king, James V., escaped from his hands, and sentence of forfeiture was passed against Angus and his kinsmen. The king swore that while he lived the Douglasses should have no place in his kingdom; and he kept his vow. On his death 1542, Angus returned to Scotland, and was restored to his honors and possessions. He died at Tantallon 1556. His nephew, who succeeded him, died two years afterward, leaving an only son, *Archibald, eighth Earl of Angus*. This 'Good Earl,' as he was called, died 1588, when his title devolved on his kinsman *William*, grandson of Sir William Douglas of Glenbervie, second son of Archibald Bell-the-Cat. Dying 1591, he was succeeded by his son *William*, who next year obtained from the crown a special recognition of his high privileges as Earl of Angus, of taking the first place and giving the first vote in parliament, of leading the vanguard in battle, and of bearing the crown in parliament. He seems to have been a man of scholarly tastes, and is said to have written a history of the Douglasses. As he was a Rom. Catholic, he was forced to leave Scotland, and spent his latter years in exercises of devotion at Paris, where he died 1611, being succeeded by his son.

MARQUISES AND DUKE OF DOUGLAS, AND LORDS DOUGLAS.—*William, eleventh Earl of Angus*, was created Marquis of Douglas 1633, and dying 1680, was succeeded by

his grandson James, who died 1700, leaving issue one son and one daughter. The son *Archibald, third Marquis of Douglas*, was created Duke of Douglas 1703, and died childless 1761, when his dukedom became extinct, and his marquisate devolved on the *Duke of Hamilton*, as descended in the male line from William Earl of Selkirk, third son of the first Marquis of Douglas. The duke's sister, *Lady Jane Douglas*, born 1698, married 1746 to Sir John Stewart of Grandtully, was said to have given birth at Paris to twin sons 1748. One of them died 1753; the other, 1761, was served heir of entail and provision general to the Duke of Douglas. An attempt was made to reduce his service, on the ground that he was not the child of Lady Jane Douglas; but the House of Lords, 1771, gave final judgment in his favor. He was made a British peer 1790, by the title of *Baron Douglas of Douglas Castle*, which became extinct on the death of his son *James, fourth Lord Douglas*, 1857, when the Douglas estates devolved on his niece, the *Countess of Home*. The title of Earl of Angus was claimed 1762, as well by the *Duke of Hamilton* as by *Archibald Stewart*, afterward Lord Douglas; but neither urged his claim to a decision, and the title is still in abeyance. The right attached to it of bearing the crown of Scotland, was debated before the Privy Council 1823, when it was ruled that Lord Douglas's claim to that honor, being a claim of heritable right, fell to be decided in a court of law. It has been supposed that the motto of the Douglas arms, *Jamais arrièrè*, 'Never behind,' alludes to the peculiar precedence inherent in their earldom of Angus. The bloody heart commemorates Bruce's dying bequest to the Good Sir James; the three stars which the Douglasses bear in common with the Murrays, seem to denote the descent of both from one ancestor.

EARLS OF MORTON.—*Sir Andrew of Douglas*, who appears in record 1248, was apparently a younger son of Sir Archibald, or Erkenbald, of Douglas, the second chief of the house. He was father of William of Douglas, who, 1296, swore fealty to King Edward I. for his lands in West Lothian, and who was probably the father of Sir James of Douglas—surnamed of Lothian, to distinguish him from his kinsman of Clydesdale—who, 1315, had a grant from Bruce of the lands of Kincavil and Calder-clere. Sir Andrew died about 1320, being succeeded by his son, *Sir William of Douglas of Liddesdale*, who acquired the lordship of Dalkeith (by resignation of the Grahames), the barony of Aberdour in Fife, lands in Tweeddale, and great territories in Liddesdale, Eskdale, and Ewesdale which had been forfeited by the Soulises and Lovels. In 1335, he had a grant of the earldom of Athol, but resigned it 1342. The Knight of Liddesdale—as he was called by his contemporaries, who regarded him as 'the flower of chivalry'—was assassinated 1353 by his kinsman, William first Earl of Douglas, partly to revenge his wife's dishonor, partly to revenge the death of Sir David of Barclay, who had been assassinated at the instance of the Knight of Liddesdale, in revenge for the slaughter of his brother John. Dying child-



less, the Knight of Liddesdale was succeeded by his nephew, *Sir James of Douglas of Dalkeith*. This great chief, who died 1420, saw Froissart sit as a guest at his board; he possessed books of law, grammar, logic, and romance; and enjoined in his will that all the volumes which he had borrowed from his friends should be returned to them. His alliances were princely. His first wife was daughter of 'Black Agnes,' heroic Countess of Dunbar: his second was sister of King Robert II.; and he matched his eldest son, *Sir James of Douglas of Dalkeith*, with a daughter of King Robert III. Their grandson married a daughter of King James I., and in 1458 was created *Earl of Morton*. This earl's grandson, the third earl, dying without male issue 1553, the earldom devolved on his daughter's husband, the Regent Morton—*James Douglas*, great-grandson of Archibald Bell-the-Cat. After his fall, the title went to *Archibald eighth Earl of Angus*; and when he died childless 1588, it passed to the lineal male descendant of Sir Henry of Douglas (son of Sir John of Douglas, who was brother of the Knight of Liddesdale), *Sir William Douglas of Lochleven*, who thus became seventh Earl of Morton. His losses in the great civil war compelled him, 1642, to sell Dalkeith to the Earl of Buccleuch, and his Tweeddale and Eskdale lands to others; but Aberdour and other old domains of the family still remain with his successor, the *Earl of Morton*, who, there is every reason to believe, descends legitimately in the male line from William of Douglas, the great progenitor of the race in the 12th century.

EARLS, MARQUISES, AND DUKES OF QUEENSBERRY; EARLS OF MARCH, AND EARLS OF SOLWAY.—*James, second Earl of Douglas and Mar*—hero of Otterburn—had an illegitimate son, *Sir William of Douglas of Drumlanrig*, whose descendants were created Viscounts of Drumlanrig 1628, Earls of Queensberry 1633, Marquises of Queensberry 1682, Dukes of Queensberry 1684, Earls of March 1697, and Earls of Solway 1706. On the death of the fourth Duke of Queensberry 1810, that title, with the barony of Drumlanrig and other lands, went to the *Duke of Buccleuch*; the title of Marquis of Queensberry, with the baronies of Tinwald, Torthorwald, etc., went to the heir-male of the family, *Sir Charles Douglas of Kelhead*; and the title of Earl of March, with the barony of Neidpath, went to the *Earl of Wemyss*. The title of Earl of Solway had become extinct in 1778.

EARLS OF SELKIRK, FORFAR, AND DUMBARTON; VISCOUNT BELHAVEN, AND LORDS MORDINGTON.—In 1646, the third son of the first Marquis of Douglas was created *Earl of Selkirk*. In 1651, the eldest son of the same marquis was created *Earl of Ormond*, and in 1661, *Earl of Forfar*. In 1675, the fourth son of the same marquis was created *Earl of Dumbarton*. In 1641, the second son of the tenth Earl of Angus was created *Lord Mordington*. In 1633, *Sir Robert Douglas of Spot*, a descendant of the Morton family, was created Viscount of Belhaven. Of all these titles, those of the Earl of Selkirk and the Earl of Belhaven are the only ones not now dormant or extinct.

*A History of the Houses of Douglas and Angus*, by David



Hume of Godscroft, was published, Edinburgh 1644, 1 vol. fol.; reprinted 1748, 2 vols. 8vo. It preserves the traditions of the family, and has some literary merit, but its accuracy is not to be trusted. The earlier history of the Douglasses has been critically examined by the late George Chalmers in his *Caledonia*, I., pp. 579-584 (Lond. 1807); by Mr. Riddell in his *Remarks upon Scotch Peerage Law*, pp. 174-178 (Edin. 1833); by Mr. Cosmo Innes, in the *Registrum Episcopatus Moraviensis*, pp. xlv.-xlvii. (Edin. 1837); and the *Liber S. Marie de Culchou*, I., pp. xxvii., xxviii. (Edin. 1846); and by Mr. Joseph Robertson in the *Origines Parochiales Scotiæ*, I., pp. 152-160 (Edin. 1851). The descent of the Houses of Angus and Dalkeith was ascertained first by Mr. Riddell in his *Remarks upon Scotch Peerage Law*, pp. 154-164 (Edin. 1833); and in his *Stewartiana*, pp. 82-84, 137-142. The charters and correspondence of the Morton family have been edited for the Bannatyne Club by Mr. Cosmo Innes in the *Registrum Honoris de Morton* (Edin. 1853, 2 vols. 4to).

DOUGLAS, GAWYN, or GAVIN: Scottish poet: 1474 (or 5)-1522; third son of Archibald, fifth Earl of Angus. He was educated at St. Andrews for the priesthood, and was early appointed to the rectory of Haweh or Prestonkirk. In 1501 he was made dean or provost of the Collegiate Church of St. Giles. From the marriage of his nephew, sixth Earl of Angus, to the widowed queen of James IV., Douglas expected rapid preferment; but the jealousy of the nobility and the Regent Albany was such that D., who had through the influence of the queen obtained the bishopric of Dunkeld directly from the Pope, was tried before the Scottish peers, found guilty of conspiring against the privileges of the crown, and condemned to imprisonment. After reconciliation with the regent, he was set at liberty in about a year, and inducted into his bishopric. Owing to his nephew's ill-treatment of the queen, who thereupon joined with the regent against the Douglasses, Gavin D. was deprived of his bishopric, on which he went to England to obtain the aid of Henry VIII., but was suddenly cut off at London by the plague, and was buried in the Savoy Church. One of D.'s earliest poetie efforts was a translation of Ovid's *Remedy of Love*, but it has not been preserved. In 1501, he wrote his *Palace of Honor*, addressed to King James IV. The leading idea of the poem, and some of the details, resemble Chaucer's *Temple of Fame*. *King Hart*, the only other long poem of D., presents a metaphorical view of human life. But the most remarkable production of this author was a translation of Virgil's *Æneid* into Scottish verse, made 1512-3, the first version of a Latin classic published in Britain. It is generally deemed a masterly performance, though in too obsolete a language ever to be popular. D.'s verse is far from rhythmical to modern ears; yet the felicitous character of his allegories, and the rich beauty of his descriptions, might well tempt the lovers of genuine poetry to give him a trial. A collected edition of his works, four vols., was issued 1874.

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DOUGLAS, General Sir HOWARD, Bart., G.C.B. 1776-1861. Nov.; b. Gosport, England; son of Admiral Sir C. Douglas. Entering the army when young, he served in Spain and Portugal 1808-9, and again in Spain 1811-2. He was gov. of New Brunswick 1823-29, Lord High Commissioner of the Ionian Islands 1835-40, and M.P. for Liverpool 1842-47. In 1851, he became a gen. in the army, and col. of the 15th regt. foot. He wrote several treatises, among which are *An Essay on the Principles and Construction of Military Bridges, and the Passage of Rivers in Military Operations* (Lond. 1816); a treatise on *Naval Gunnery* (1819; 4th edit., 1855); *Observations on Carnot's Fortification*, etc. His treatise on *Naval Gunnery* is regarded as a standard authority in foreign countries, though his recommendations were not acted upon by the British Admiralty until 13 years after the publication of his work. He censured the conduct of the war in the Crimea in 1855, and declared that Sebastopol could not be reduced unless by a change in the plan of operations, such as he traced. His prophecy was verified by the event. He also published *Considerations on the Value and Importance of the British and North American Provinces*, and a treatise entitled *Naval Evolutions*.

DOUGLAS, JOHN, D.D.: 1721-1807, May 18; b. Pittenween, Fifeshire, Scotland; son of a respectable shopkeeper. In 1736, he entered St. Mary's College, Oxford, where he took his bachelor's degree after five years' study. D.'s life is little more than a chronicle of his numerous preferments, which ended in the see of Salisbury 1791. D. only occasionally resided on his livings. He generally spent the winter months in London, and the summer months at the fashionable watering places, in the society of the Earl of Bath, who was his great patron. He applied himself to literature; but most of his productions were interesting only to his own time. Among other works, chiefly pamphlets, he wrote a *Vindication of Milton from the Charge of Plagiarism adduced by Lauder* (1750); *A Letter on the Criterion of Miracles* (1754); an ironical pamphlet against the Hutchinsonians and Methodists, entitled *The Destruction of the French foretold by Ezekiel* (1759); and the *Introduction and Notes to Captain Cook's Third Voyage* (1781).

DOUGLAS, STEPHEN ARNOLD: 1813, Apr. 23-1861, June 3; b. Brandon, Vt.: statesman. He worked on a farm till 15 years old, then with a cabinet maker 18 months, and afterward spent a year at Brandon Acad., and on the re-marriage of his mother and her removal to Canandaigua, N. Y., took the academic course at the acad. there. He then began studying law, but unwilling to be a burden upon his mother during the necessary course, went to Ill. 1833, with the intention of supporting himself by teaching. At Winchester he earned his first wages by acting as clerk to an auctioneer, and with a capital of \$6 opened a private school. He obtained 40 pupils, taught them in the daytime, read law at night, and practiced before the police justice in small cases on Saturdays. In



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1834, Mar., he was admitted to the bar in Jacksonville, Ill., and established an office there. Within a month he entered upon his political career by defending Pres. Jackson's administration in a democratic mass meeting, where he made such a favorable impression that a large amount of collection business began pouring into his office from total strangers, and he was elected attorney-gen. of the state by the legislature, though not yet 22 years old. In 1835 he resigned this office on being elected to the legislature; 1841 was chosen a judge of the supreme court of the state; 1843, '44, '46, was elected a member of congress as a democrat; and 1847 became U. S. senator. In the early part of his congressional career he took high rank on all questions of constitutional law, and made himself an acknowledged power in the deliberations of the house. Subsequently his voice was heard, and his influence felt on all important matters of legislation and national concern. During the Oregon controversy he declared that the United States had a clear and unquestionable title to the whole of that territory up to lat.  $54^{\circ} 40'$  n., and urged the termination of the joint occupation, the establishment of a territorial govt., and the preparation of the country for war in case the assertion of our national rights led to complications with Great Britain. He made a great defense of Gen. Jackson's conduct in New Orleans, when advocating the bill to refund the \$1,000 fine imposed upon him by Judge Hall, and was one of the most active advocates of the admission of Tex. as a state into the Union. In 1846 he was chairman of the committee on territories, and reported the joint resolution by which Tex. was declared to be one of the United States. In the long and acrimonious debate upon this measure, he maintained its constitutionality in a powerful speech; he did not believe that congress had a right to impose an anti-slavery restriction upon any of the territories or states of the Union, but was willing that the principle of a division of the public domain between the two sections of the country as tendered by the north and accepted by the south 1820, which had been established to cover the acquisition of La., should be extended to Tex. In 1846, he opposed David Wilmot's 'proviso' for the restriction of slavery to any new territory that might be acquired from Mexico by treaty of peace, and 1848, endeavored to have slavery prohibited in all the territory n. of the parallel of  $36^{\circ} 30'$  by offering an amendment to the Oregon bill extending the Mo. compromise line to the Pacific Ocean. The senate adopted the amendment, the house rejected it, and from these actions arose the great sectional agitation, which the 'compromise measures of 1850' (q.v.) partially allayed. In 1852 he was re-elected U. S. senator, and his name was presented to the democratic convention in Baltimore as a candidate for the presidency. In 1853, Dec., he reported the bill for the organization of govts. in the territories of Kan. and Neb. and the whole subject of slavery in the new territories was renewed. Under his lead, however, the bill was carried through both branches of congress, and constitutes what



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is known as the 'territorial legislation of 1854.' In 1856 his name was again presented to the democratic convention for the presidential nomination, but, opposing the principle of the two-thirds rule, he withdrew, and James Buchanan was nominated. In 1858 he was a second time re-elected U. S. senator, after a memorable canvas, distinguished by his joint discussions with Abraham Lincoln. In that year, and again 1860 he made a tour of the southern states, and everywhere denied the right of secession; and as a member of the 'committee of thirteen' and on the floor of the senate exerted all his great powers and influence to avert civil war. He received the nomination for pres. by the adjourned democratic convention at Baltimore 1860, was opposed by a large number of his former political associates on account of what was called his 'squatter-sovereignty' doctrine, which left the territories open to the introduction of slavery; and in the election received a popular vote of 1,365,976 and an electoral vote of 12. After hostilities opened he gave a giant's support to Pres. Lincoln and the Union cause, till stricken with his fatal illness, and even then dictated a death-bed message to all his political friends and opponents to unite in support of the govt., to obey the laws, and uphold the constitution. At the time of his death he had served in the U. S. senate 14 years, and been chairman of the committee on territories (then the most important one) in the house two years and in the senate 11 years. The bills for organizing the territories of Minn., Or., N. Mex., Utah, Wash., Kan., and Neb., and for the admission of the states of Io., Wis., Cal., Minn., and Or., were reported and carried through by him. He was married twice, and his eldest son, Robert M. D., was Pres. Grant's private sec. for a time.

DOUGLASS, *dūg'las*, DAVID BATES, LL.D.: 1790, Mar. 21—1849, Oct. 19; b. Pompton, N. J.: engineer. He graduated at Yale College 1813; was immediately appointed 2d lieut. corps of engineers, U. S. A., and placed in command of the sappers and miners at the U. S. Milit. Acad.; participated in the battles of Niagara and Lundy's Lane, and was promoted 1st lieut. and brevetted capt. for gallantry in repairing Fort Erie under the enemy's fire; was appointed assist. prof. of nat. and experimental philos. at the U. S. Milit. Acad. 1819, and of civil and milit. engineering 1823; and resigned from the army 1831. He then accepted the appointment of chief engineer of the Morris Canal Company (N. J.), and introduced the system of inclined planes instead of locks in the construction of that work. On the completion of the canal 1832, he was appointed prof. of nat. philos. and civil engineering in the Univ. of New York; resigned 1833; surveyed the Brooklyn and Jamaica railroad on Long Island; and made the surveys, plans, and estimates for supplying the city of New York with water from the Croton river 1833-35, and was chief engineer of the work till 1836, Oct. He then planned and laid out Greenwood Cemetery, Brooklyn, 1838-41; was pres. of Kenyon College, O., 1841-44; planned and laid out the cemeteries in Albany and Québec; de-

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signed the supporting wall for Brooklyn Heights and the water-works system of that city; and was appointed prof. of mathematics at Hobart College, N. Y., 1848. His remains were buried in Greenwood cemetery at the request and expense of the board of directors.

DOUGLASS, FREDERICK: b. Tuckahoe, near Easton, Md., 1818, Feb.: orator; son of a white father and a negro slave mother. He was reared a slave on the plantation of the Auld family under the name of Frederick Bailey till he was 10 years old, when his master allowed him to hire his own time and sent him to live with a relative in Baltimore. There he learned to read and write, and found employment in a shipyard. In 1838, Sep., disguised as a sailor, and with a 'sailor's protection,' a certificate signed by the authorities and given all colored seamen leaving Baltimore and other Southern ports as a guarantee against molestation because of their race, which had been given him by a colored freeman, he fled from slavery, made his way to New York in safety, and then sought employment in the shipyards at New Bedford, Mass. He changed his name from Bailey to Douglass, married, and worked at whatever he could find to do. William Lloyd Garrison and other prominent anti-slavery leaders were favorably impressed with his intelligence, earnestness, and yearning for knowledge, aided him in his efforts toward self-education, and invited him to attend an anti-slavery convention at Nantucket, where he made a thrilling speech, 1841. Immediately afterward, he was appointed an agent of the Mass. Anti-Slavery Soc., and for four years travelled through the New England states, lecturing with great eloquence and effectiveness. Fearing that the prominence thus attained might lead to his capture and return to slavery, he went abroad 1845, and spent two years in lecturing on slavery in England, Ireland, Scotland, and Wales. In 1846 a number of persons interested in him, at the instance of Mrs. Henry Richards, of Baltimore, one of his earliest friends, subscribed \$750 to purchase his freedom, and on Dec. 5, Hugh Auld signed a full release, liberation, and manumission for 'my negro man named Frederick Bailey, otherwise called Douglass.' Thus secure against capture D. returned to the United States 1847, started *Frederick Douglass's Paper*, afterward *The North Star*, at Rochester, N. Y., and conducted it successfully several years. In 1859 he was accused of complicity in the John Brown raid on Harper's Ferry, Va., and a warrant was issued for his arrest, but he escaped into Canada and thence to England. During the civil war he aided in enlisting colored troops for the Union army, and on the abolition of slavery applied himself to lecturing. In 1870 he became editor of the *New National Era* at Washington; 1871 was appointed assist. sec. to the Santo Domingo commission, and, on his return, a member of the territorial council of the Dist. of Columbia; 1872 was presidential elector-at-large for N. Y. and bearer of the electoral vote to Washington; 1876 was appointed U.S. marshal for the D. C. and served till 1881, when he be-



## DOWNING COLLEGE—DOWNS.

came sec. of the treasury and commissioner of customs, was created a baronet 1663, recalled from a special mission to Holland and imprisoned in the tower 1671; and subsequently regained the king's favor. Downing street, London, was named after him, and one of his grandsons founded Downing College, Cambridge, Eng.

DOWNING COLLEGE, CAMBRIDGE, England: founded solely by Sir George Downing of Gamlingay Park, Cambridge, who, by a will of date 1717, Dec. 20, devised his estates in the counties of Cambridge, Bedford, and Suffolk to various relations in succession, and on failure thereof, to build and found a college on a plan to be approved of by the two archbishops of England and the masters of St. John's and Clare colleges. Owing to various litigations and other difficulties, it was not till 1800, Sep. 22, that the college received its charter, sealed with the Great Seal, nor till 1821, May, that the buildings were sufficiently advanced to admit of undergraduates residing and keeping terms. The college will consist of a master, two professors (one of law and one of medicine), at least eight fellows, and at least ten scholars; but at first only the master, professors, and three fellows were appointed. In 1881 only six of the eight fellowships were filled up. Of the eight fellows two must be resident, and of these one must be in holy orders; the resident fellows hold their fellowships for life, but the tenure is affected by marriage; the six non-resident fellows, who are presumed to be persons actively engaged in the studies of law and medicine, hold their fellowships for 12 years. This college had in 1881 about 70 members of senate, 80 undergraduates, and 200 members on the boards.

DOWNPATRICK (Mount of Patrick), or simply Down: municipal and cathedral town in the south of County Down, of which it is the capital. It is near the mouth of the Quoyle, which flows into the s.w. end of Lough Strangford, 74 m. n.n.e. of Dublin; 21 m. s.s.e. of Belfast, with which town it is connected by railway. The cathedral was restored 1790 on the site of one built 1412, and burned 1538 by Lord Deputy Grey. A handsome Rom. Cath. church was erected here 1872. Vessels of 100 tons reach the quay a mile from Downpatrick. It has manufactures of linen, soap, leather, and malt liquors. Northwest of D. are the remains of great earth-works, three-quarters of a m. in circuit, inclosing a conical rath 60 ft. high and 2,100 in circumference. D. was famous before the arrival of St. Patrick, who founded religious establishments here. D. was burned by Edward Bruce 1315, and plundered by O'Neil 1552. The holy wells of St. Patrick at Struel, 1½ mile e. of D., were formerly resorted to by Rom. Cath. pilgrims from all Ireland, but for the last 50 years the pilgrimage has ceased. Pop. (1871) 3,621; of whom 1,630 Rom. Cath., 1,124 Episc., 749 Presb. Pop. (1881) 3,902. (1891) 3,132.

DOWNS, n. plu. *downz* [Dut. *duyne*; F. *dunes*, sandhills by the sea-side: Fris. *döhne*, a hillock of sand or snow: AS. *dūn*, a hill, downs: Gael. *dun*, a hill, a fortification]: elevations of sand thrown up by the sea or the wind along the



in prose 1601, and of several vols. of Latin verse and of philological notes on Horace, Catullus, Tibullus, Petronius Arbiter, and Plautus.

DOUSE, or DOWSE, *v. dows* [a probable corruption of DOUCHE, which see: Scot. *dook*, to plunge under water: Dut. *doesen*, to push with force and noise]: to thrust into water; to lower or slacken suddenly; in *slang*, to extinguish as a light. DOUS'ING, *imp.* DOUSED, *pp. dowsd*.

DOUT, *v. dowl* [contr. of *do out*]: in *OE.*, to put out; to extinguish.

DOVE, *n. dūv* [Dut. *duyve*; Icel. *dufa*, a dove—probably from the same root as *dive*, because of its habit of ducking the head—from Dut. *duypen*, to duck the head—compare Lat. *columba* with Gr. *Kolumban*, to dive]: a pigeon; the term is sometimes used as word of endearment. The name is sometimes extended, as the name pigeon, to the whole family of *Columbidæ*; sometimes restricted—at least when used without prefix—to the genus *Columba* of the more recent, ornithological systems. No distinction between the terms dove and pigeon is sanctioned either by constant scientific or general popular use. Audubon attempts to make a distinction, giving the name pigeon to those species of which many nests are built close together on the same trees, and dove to those which are solitary in their nidification; but this distinction is quite unsuitable to the European species, and contrary to British usage. Other attempts at distinction have not gained acceptance. See PIGEON. DOVE-COTE, or DOVE-COT, a small house for pigeons. DOVE-DOCK, *n.* the coltsfoot, *Tussilago Forfara*. DOVE-FLOWER, *n.* in *bot.*, the genus *Peristeria*. DOVE-KIE, *n.* in *ornith.*, a name given to the Black Guillemot (*Uria grylle*) a native of the Arctic regions. DOVE'S-FOOT, *n.* in *bot.*, popular name of *Geranium molle*, from the form of the leaf; the columbine, *Aquilegia vulgaris*. DOVETAIL, *n. -tāl*, a method of fastening the ends of pieces of wood together, by slipping the one, cut in the form of a dove's tail, into the correspondent notches of another; a strong way of jointing: *V.* to joint or unite strongly. DOVETAILING, *imp.* DOVETAILED, *pp. tāt*. DOVETAIL-HINGE, *n.* a hinge whose leaves are wider at their outer edges than at their hinging edges. DOVETAIL-JOINT, *n.* the junction of two pieces by means of splayed tenons and corresponding mortises of the respective parts. DOVETAIL-MOLDING, *n.*, in *arch.*, a kind of molding used in Roman architecture, and somewhat resembling a dovetail. DOVETAIL-PLATES, *n.* in *ship-build.*, plates of metal let into the stern-post and keel of a vessel to bind them together. Similar plates are used for joining the stern-foot with the fore-end of the keel. DOVETAILING-MACHINE, *n.* a machine having a gang of chisels or saws for cutting dovetail-mortises or the kerfs therefor. DOVE'-LET, *n.* a little dove.

DOVE, in Christian Art: an emblem of the Holy Spirit, no doubt from the dove-like form in which the Spirit descended on the Lord Jesus at his baptism. From the dove being used also to symbolize purity, it is generally repre-

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sented white, with its beak and claws red, as they occur in nature. In the older pictures, a golden nimbus surrounds its head; the nimbus being frequently divided by a cross, either red or black. In stained glass windows the dove is seen with seven rays proceeding from it terminating in seven stars, significative of the seven gifts of the Holy



Pyx in the form of a Dove.

Spirit. Holding an olive branch, the dove is an emblem of peace. When seen issuing from the lips of dying saints and martyrs, it represents the human soul purified by suffering. A dove with six wings is a type of the church of Christ; and when so employed, it has the breast and belly of silver, and the back of gold, two wings being attached to the head, two to the shoulders, and two to the feet. The pyx or box for containing the Host (q.v.) in Rom. Cath. churches, is sometimes in the form of a dove, and suspended over the altar; and the dove is often placed on the covers of fonts. In this position it may still be seen in parish churches in England.

DOVE, *dō'veh*, HEINRICH W.: one of the ablest recent physicists of Europe: 1803-1879, Apr. 6; b. Liegnitz, Silesia, where his father was a merchant. He studied at Breslau and at Berlin, taking his degree at Berlin 1826. He was successively 'privatdocent' and asst. prof. of nat. philosophy in Königsberg. Having been transferred to a similar post in Berlin, he subsequently became full prof., and was elected to a seat in the Royal Acad. of Sciences. His writings, which are very numerous, are in the *Memoirs* of that Acad., and in Poggendorff's *Annalen*, besides several published separately. The most celebrated refer to meteorology, climatology, induced electricity, and circularly polarized light. Among his works are *Ueber Mass und Messen* (2d ed., Berlin 1835), a treatise on the art of measuring, and the origin and comparison of the metrical standards of different nations; *Meteorologische Untersuchungen* (Berlin 1837); *Ueber die nicht periodischen Aenderungen der Temperaturvertheilung auf der Oberfläche der Erde* (4 vols. Berlin 1840-47); *Untersuchungen in Gebiete der Inductionselectricität* (Berlin 1843). In conjunction with other



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distinguished German philosophers, D. commenced, 1837, the publication of an extensive series of treatises on different branches of nat. philosophy. This work, called *Repertorium der Physik*, remains unfinished. In his capacity of director of all the Prussian observatories, he published annually an account of their labors. To him is due, among a great variety of optical discoveries, the application of the stereoscope to the detection of forged bank-notes—an ingenious and useful idea. To English readers, D. is known best by his treatise on the *Distribution of Heat on the Surface of the Globe*, published 1853 by the British Association. *Das Gesetz der Stürme* (4th ed. 1874) also has been translated (The Law of Storms). Other works are *Ueber Electricität* (1848); *Optische Studien* (1859); *Eiszeit, Föhn, u. Sirocco* (1867); *Klimatologie von Norddeutschland* (1871).

DOVER, v. *dō'vēr* [Icel. *dur*, a light sleep; *dura*, to sleep at intervals]: in *Scot.* and *O.E.*, to sleep at intervals; to be in a doze; to slumber lightly: N. a light fitful slumbering. DO'VERING, imp. DO'VERED, pp. -*vérđ*.

DOVER, *dō'vēr*: city, cap. of Kent co., and of the state of Del.; on Jones river, and the Philadelphia Wilmington and Baltimore railroad; 5 m. w. of D. bay, 48 m. s. of Wilmington. It is in the centre of a great fruit-growing region and fruit-canning trade, on high ground, and is laid out with wide, straight streets that cross each other at right angles, and built up chiefly with brick. Among its noteworthy buildings are a handsome state-house, large court-house, and new U. S. post-office building. Connected with the state-house is a state library with upward of 50,000 vols. The educational interests are promoted by a public school system with 8 graded departments, the Conference Acad. for boys and girls, and 3 select schools. There are 7 churches; 1 national (cap. \$100,000) and 1 state (cap. \$224,000) bank, 6 fruit evaporating and packing establishments, a steam flouring mill, foundry, machine shop, and sash, fruit crate, glass, and carriage factories. The city has valuable gas, and water-works, 2 weekly newspapers, and many handsome residences. Pop. (1870) 1,906; (1880) 2,811; (1890) 3,061; (1900) 3,329.

DO'VER: city, cap. of Strafford co., N. H.; on both sides of the Cocheco river, at the head of navigation; lat. 43° 13' n., long. 70° 54' w.; on the Boston and Me. railroad, and terminus of the Portsmouth and D., and D. and Winnipiseogee railroads; 12 m. n.w. of the Atlantic Ocean, 35 m. e. of Concord, 68 m. n. by e. of Boston. The falls of the Cocheco, within the city limits, afford abundant water-power. Additional power is obtained from Black river, s. of the city; Bow Pond, 15 m. n.w. of D. has been converted into a storage reservoir, and in the dry season water for the mills is procured from that source. D. is beautifully laid out, the unevenness of its surface and the consequent irregularity of many of its streets, combined with its numerous elegant residences, give it a very attractive and picturesque appearance. Its industries include several large cotton and woolen mills, an extensive print work with a



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capacity of over 30,000,000 yards annually, manufactories of boots and shoes, oil cloth, hats and caps, sandpaper, and glue, and several tanneries, brass and iron foundries, and machine shops. There are three national banks, cap. \$450,000, and 3 savings-banks; 3 hotels; 1 daily, 4 weekly, 2 semi-monthly newspapers; city hall, court-house; public library; 11 churches; high school, 3 grammar schools, and 35 primary schools. D. was founded 1623, attacked by Indians who killed 23 and took 29 inhabitants prisoners 1689; and was chartered 1855. Pop. (1870) 9,294; (1880) 11,687; (1890) 12,790; (1900) 13,207.

DO'VER: parliamentary and municipal borough in the east of Kent, England, 66 m. e.s.e. of London; headquarters of the s.e. dist. of the British army. It is not only a charmingly situated watering-place, but, being the nearest point of the English coast to France, is a seaport of rapidly growing importance. Within the last few years £750,000 have been expended by the govt. in constructing a magnificent pier, which, extending 2,100 ft. seaward, terminates in a fort fitted to bear two guns of heavy caliber, so mounted, that they will completely sweep the Channel. This granite isthmus affords a safe anchorage for vessels in the stormiest weather, and travellers for Calais, about 25 m. distant, or Ostend, for which places passenger and cargo steamers leave twice a day, are enabled to embark or land in any state of the tide, or even when a gale is raging. Works which will cost over a million pounds are contemplated by the government to carry out a scheme for the erection of Dover Bay into a naval rendezvous and coaling-station. The fortifications comprise Dover Castle, which occupies a commanding position on the chalk cliffs, 375 ft. above the sea, and in the construction of which Saxons and Normans displayed no small amount of ingenuity; the Western Heights, Fort Burgoyne, the South Front, the Drop Redoubt, the Citadel, the Western Outworks, and the North Centre Bastion. No special trade is attached to the town, which transacts a miscellaneous maritime business with the French and Belgian ports. The borough returns, since 1885, one member to parliament. D. is well sheltered by the cliffs, and ends landward in a charming valley leading to what is known as 'The Garden of Kent.' In Roman days D. was known as Duris; the Normans called it Dovert; the French, Douvres; while in legal documents of this day the town is Dovar, all four terms being variations of the word 'Dour,' the name of the small river which runs through the town. Fortified and walled by William the Conqueror, during whose reign it was nearly burned down, noted as the place of King John's submission to the pope, besieged by the French, held during the civil war by the Parliamentarians, threatened by the first Napoleon, and celebrated as the headquarters of the Lord Wardens of the Cinque Ports, D. holds a distinguished place in English history. Three submarine cables connect it with the continent, and if the designs of eminent French and English civil engineers are practicable, a tunnel may be constructed under the Channel, which will bring France within an hour

or an hour and a half's journey from Dover. Pop. (1871) 28,506; (1881) 28,486; (1891) 33,418.

DO'VER, STRAIT OF (*Fretum Gallicum*, *Pas de Calais*): the sea-channel between England and France, connecting the English Channel and North Sea, whose tides meet here. It is 18 to 25 m. broad, and 6 to 29 fathoms deep, but at Warne and Ridge Shoals only  $1\frac{1}{2}$  to 4 fathoms. The English coast consists of chalk cliffs 300 to 600 ft. high, succeeded on the south by lower greensand, and the French, from Calais to Cape Grisnez, is of similar strata. Britain and the continent seem to have been once united here by an isthmus. In 1875, Aug., Captain Webb, English naval officer, accomplished the wonderful feat of swimming the S. of D. in  $21\frac{3}{4}$  hours.

DO'VERON, or DE'VERON: river of the n.e. of Scotland rising in the w. of Aberdeenshire, a little s. of the Buck of the Cabrach (2,377 ft. high). It runs 55 m. n.e. (36 in a straight line), through adjacent parts of the counties of Aberdeen and Banff, and partly dividing them, past Huntly to the North Sea at Banff. It drains a basin of 10 sq. m., composed of syenitic greenstone, metamorphic rocks, gray-wacke, and old red sandstone.

DOVER'S POWDER: preparation of powder of ipecacuanha 1 drachm, opium in powder 1 drachm, and sulphate of potash 1 ounce. The whole is thoroughly mixed, and the ordinary dose is from 5 to 10 grains. Occasionally, saltpetre is added. It is a most valuable medicine, and acts as a sudorific, increasing the proportion of sweat or sensible perspiration. In feverish conditions, where there is the dry furred tongue, and the dry skin, and the brain out of order. D. P. is deemed injurious; but where the tongue is moist, the skin moist and soft, and the brain comparatively unaffected, it is of great service. It takes its name from an English physician who first prescribed it.

DO'VRE FJELD: see SCANDINAVIA.

DOW: see BAGGALA.

DOW, or DOU, or DUOW, GERARD: 1613–80; b. Leyden: one of the most exquisite of Dutch *genre*-painters. He received his first instructions in drawing from one Dolendo, a draughtsman, and at the age of 15 entered the school of Rembrandt. That marvellous genius for color which the latter possessed, fascinated the young painter, who soon showed a similar mastery over *chiaroscuro*, though developing artistic qualities wholly different from those of his master. The most insignificant incidents of daily life were precious to D., and were delineated with a delicacy, neatness, and care, that could not be surpassed. In his workshop, the utmost cleanliness prevailed. D. was true to nature in a degree positively wonderful. The richness, transparency, vigor, and harmony of his coloring are beyond all praise. In consequence, his pictures, though generally small in size, are considered gems of art, and have brought astonishing prices. One of his best works, *The Dropsical Woman*, is valued at 30,000 guilders.



Among his pieces are *The Village Grocer*, *The Dutch Cook*, *The Mountebank*, *The Fiddler*, *The Dentist*, and *The Interior of a Household*. His works, which are numerous, are in all the great European collections. D. died at Leyden.

DOW, LORENZO: 1777, Oct. 16—1834, Feb. 2; b. Coventry, Conn.; Meth. Episc. minister. He received a very meagre education and in early youth resolved to become a Meth. preacher. After rejection 1796, he was received into the Conn. conference 1798, appointed to the Cambridge (N. Y.) circuit 1799, and served there, in Pittsfield, Mass., and Essex, Vt., less than a year, making a visit to England and Ireland in the latter part of 1799, and again 1805. He felt that he had received a divine call to preach to the Rom. Catholics in Ireland, and while there attracted large audiences by his eccentricities and eloquence. In England he established the American system of camp-meetings, and occasioned a great controversy in the Meth. church thereby. Between his visits to England and Ireland, he preached the first Prot. sermon in Ala., and subsequently labored in La., and in many of the new settlements in the s. and s.w. He was author of *Polemical Works* (1814), *The Stranger in Charleston, or the Trial and Confession of Lorenzo Dow* (1822), *A Short Account of a Long Travel, with Beauties of Wesley* (1823), *Journal and Miscellaneous Writings*, and *History of a Cosmopolite, or the Writings of the Rev. Lorenzo Dow, containing his Experience and Travels in Europe and America up to near his Fiftieth Year*.

DOW, NEAL: reformer: 1804, Mar. 20—1897, Oct. 2; b. Portland, Me. He was educated in the Friends' Acad., New Bedford, Mass., and entered a mercantile and manufacturing career. In 1839 he became chief eng. of the fire dept., in Portland, 1851 was elected mayor of the city, and 1854 re-elected. While serving his first term as mayor he drafted a bill for the prohibition of the sale of intoxicating beverages through the state, and though its radical character threatened its defeat, he carried it successfully through the legislature, and it continues a law to-day. In 1858 he was elected a member of the legislature, and 1861, Dec., was appointed col. of the 13th regt. of Me. vols. He accompanied Gen. Butler's expedition to New Orleans; was promoted brig.gen. of vols., and assigned to the command of the forts at the mouth of the Mississippi, 1862, Apr. 28; was twice wounded in the battle of Port Hudson 1863, May, and taken prisoner while helpless; was confined in Libby Prison, Richmond, and in Mobile nearly a year; and resigned his commission 1864, Nov. 30. He made three trips to England by invitation of the Temperance Alliance of the United Kingdom and spoke in all the large cities. In the U. S. he labored indefatigably in behalf of prohibitory legislation. Gen. D. was the candidate of the national prohibition party for pres. 1880. He d. 1897, Oct. 2.

DOWAGER, n. *dow'ä-ger* [F. *douairière*, a dowager—from mid. L. *dotāriūm*; F. *douaire*, a dowry]: a title given to the widow of a prince or person of rank when he who suc-



## DOWDEN—DOWER.

ceeded her deceased husband in his titles and estates is married, there being thus two ladies with the same title; a widow of rank, with property or real estate enjoyed by her during her lifetime. **QUEEN-DOWAGER**, n. widow of a king. **DOW'AGERISM**, n. *-izm*, state, rank, or condition of a dowager.

**DOWDEN**, EDWARD, LL.D.: b. Cork, Ireland, 1843, May 3: poet. He was educated at Queen's College, Cork, and Trinity College, Dublin; obtained the vice-chancellor's prizes in English verse and English prose in the latter institution; was elected pres. of the Philosophical Soc., and gained the first senior moderatorship in logic and ethics 1863; studied divinity two years; gained the Erasmus Smith professorship of oratory in the Univ. of Dublin on competitive examination 1867; and was subsequently elected prof. of English literature there. He is author of *Shakespeare: His Mind and Art* (1872), *Poems* (1876), *Shakespeare Primer*, *Studies in Literature* (1878), *Southey* (English Men of Letters Series, 1879), *Goethe*, and *Life of Percy Bysshe Shelley* in 2 vols., founded on the family papers. He has contributed to the leading reviews and magazines of England and the United States.

**DOWDY**, n. *dow'di* [Scot. *dawdie*, a dirty, slovenly woman: Low Ger. *dödeln*, to be slow: Icel. *doddi*, languor: comp. Gael. *daoidh*, feeble, foolish]: a woman awkward and untidy in dress: **ADJ.** awkward and slovenly in dress; ill-dressed, applied only to a woman. **DOW'DYISH**, a. *-ish*, like a dowdy.

**DOWEL**, n. *dow'el* [F. *douelle* and *douille*, a tap or socket: Ger. *döbel*, a peg, a plug: Dut. *douwen*, to press into]: a projection in a stone to fit into a socket, by which it may be fastened into the adjoining one; a peg of wood or iron used in the edge of a board for fastening it to another, generally edge to edge: **V.** to fit with dowels. **DOW'ELING**, or **DOW'ELLING**, imp.: **N.** a method of uniting two boards or pieces of wood together at their edges by pins or plugs of wood or iron. **DOW'ELED**, or **DOW'ELLED**, pp. *-ëld*. **DOWEL-JOINT**, n. a junction formed by means of a dowel pin or pins, such as the heading pieces of a tight barrel head. **DOWEL-PIN**, a pin inserted into a piece of wood in order to unite it to another, generally edge to edge.

**DOWER**, n. *dow'er*, or **DOWRY**, *dow'rī* [OF. *doaire*; F. *douaire*, a dowry—from mid. L. *dotārīum*—from L. *dotārē*, to endow] the property which a woman brings to her husband on marriage. **DOW'ERED**, a. *-ërd*, having a dowry. **DOW'ERLESS**, a. without a dowry.—Also, *Dower* 'in the common law, is taken for that portion of lands or tenements which the wife hath for terme of her life of the lands or tenements of her husband after his decease, for the sustenance of herselfe, and the nurture and education of her children.'—*Coke upon Litt.* 30 b. Though the right of dower has lost much of its ancient importance, the history of this right forms an interesting chapter in the English common law. See **FINE: JOINTURE**.

The general rules of the English common law still pre-

will in the United States, and in nearly all the states at least one-third of the personal estate of the husband is given to the widow. In some states a widow has the right to elect to take one-half of the husband's estate in lieu of D. under certain contingencies, and a contract to marry on condition that the wife should receive no portion of the husband's lands has been held valid. The right to D. is determined by the laws of the place where the property is located. Usually a widow is not endowable for a term of years, however long, though in Mo. her right attaches to a leasehold of 20 years and to the personal estate in general, under certain conditions, and similar statutes are found in other states. An estate in common is subject to D. In an exchange of lands a widow may claim D. in either, but not in both; she is entitled to D. also in mines belonging to her husband if opened by him, in various species of incorporeal hereditaments, as rights of fishing and rents, and, in most states, in wild lands; but she has no right of D. in a pre-emption claim, nor as a rule, in shares of a corporation. Some statutes give her D. in lands actually purchased by her husband and on which the former owner retains a lien for the unpaid purchase money, subject to that lien; or in lands upon which her husband has given a mortgage to secure the purchase money, subject to that mortgage; but she has been denied D. in partnership lands purchased by partnership funds for partnership purposes, till the partnership debts have been paid; also in land purchased by several persons for speculative purposes. Her claim for D. has been held not subject to mechanics' liens, and as good against every one but the mortgagee where she has joined her husband in mortgaging an estate.

DOWIE, a. *dow'ī* [Gael. *dubhach*, sorrowful, sad—from *dubh*, black, dark]; in *Scot.* and *prov. Eng.*, dark; dull; spiritless; melancholy; worn out with grief. DOWFF, a. *dowf* [comp. Ger. *dumpf*, hollow, dull]: dreary; forlorn. DOWFF AND DOWIE, dreary and spiritless.

DOWIE, JOHN ALEXANDER: religionist; b. in Scotland; was a pastor in Australia; later came to the U. S. and settled in Chicago, Ill.; became a "healer," a real-estate operator, newspaper proprietor, and a manufacturer. He founded a lace-making industry near Waukegan, Ill., and called the place Zion and his followers Zionites. He announced that he was the Prophet Elijah returned to earth. His teachings and methods have been severely condemned by the pulpit and press.

DOWLAS, n. *dow'lās* [*Dowlais*, in France, where manufactured]: a kind of coarse strong linen cloth used by British working-people for shirts, and manufactured largely at Knaresborough in Yorkshire, at Dundee, and at Newburgh and other places in Fifeshire.

DOWLATABAD, *dow-la-ta-bād'* (in English, *Abode of Prosperity*): strongly fortified town of Hindustan, within the Nizam's dominions, near the n.w. frontier; lat. 19° 57' n., and long. 75° 19' e. The town is commanded by a rock-fortress, which, with a height of about 500 ft., is



## DOWLE—DOWN.

**scarped** into a perpendicular for the lowest third or the altitude. This stronghold is all the more formidable from its being completely isolated, being fully 3,000 yards distant from any other eminence. The town of D. has recently greatly decayed, and only a small portion of it is now inhabited.

**DOWLE**, n. *dowl* [F. *douillet*, soft, downy—a dimin. of OF. *douille*, soft, tender; comp. Gael. *duille*, a leaf or spray]: in *OE.*, a leaf; a feather; a portion of down of birds, young hair of the beard: **ADJ.** leafy; feathery; downy.

**DOWN**, n. *down* [Ger. *daune*; Icel. *dún*; Dan. *duun*, the lightest and softest kind of feathers: Ger. *dunst*, exhalation, vapor]: the fine soft feathers of fowls; any fine hairy substance, light enough to float in the air. **DOWNY**, a. -*ī*, soft, like down.

**DOWN**, ad. or prep. *down* [AS. *of dune*, from the hill, as in OF. *à mont*, to the hill, *à val*, to the valley, expressing 'upward and downward' (see **Downs**)]: from a higher to a lower place; in a descending direction; on the ground, extended or prostrate on any surface; toward the mouth of a river; below the horizon, as the sun; into a due consistence, as, to boil down; into bad odor or disgrace, as, to cry down. **DOWN-BOW**, n. in *mus.*, the bow drawn over the strings from the heel or holding part of the bow to the point; the greatest power of tone in the strings is elicited by the down bow, and accordingly it is generally used on the accented beats of a bar. **DOWNCAST**, a. -*kāst*, dejected; directed to the ground, as the eyes or face; applied to that part of the shaft or perpendicular excavation of a mine which conveys the ventilating air downward into it, the *upcast* being the shaft carrying the foul air up from the mine. **UP AND DOWN**, here and there. **DOWNCOME**, n. a sudden fall of anything. **DOWN-EASTER**, n. [colloq.]: native or inhabitant of New England. **DOWNFALL**, n. -*faul*, ruin; destruction; ruin by violence or decay; sudden fall or depression. **DOWNFALLEN**, a. -*faʷln*, ruined; fallen. **DOWN-HAUL**, n. *naut.*, a rope for hauling down a staysail, jib, or other fore-and-aft sail. With staysails it passes along the stay through the cringles, and is attached to the upper corner: **V.** to haul or pull down. **DOWN-HEARTED**, cast down; dejected in spirits. **DOWN-HILL**, n. descent; slope. **ADJ.** sloping. **DOWN LINE**, n. (in *Britain*), that line of a railroad which leads from the main terminus toward the provinces or to subordinate stations. **DOWN-LYING**, n. time of rest or repose: **ADJ.** *familiarly*, about to be in child birth. **DOWNRIGHT**, a. plain; open; undisguised; blunt: **AD.** in *OE.*, straight or right down. **DOWNRIGHTLY**, ad. -*li*. **DOWNRIGHTNESS**, n. **DOWN SHARE**, n., in *agri.*, a turf-paring plow, used in England, where the rolling treeless tracts are called Downs. These tracts in Sussex are the home of the Southdown sheep. **DOWN SITTING**, rest; act of sitting down. **DOWN-TRAIN** (in *Britain*), a train on its way from London to any provincial terminus: see under **TRAIN**. **DOWN THE RIVER**, toward its mouth, as going with its flow.



## DOWN—DOWNES.

**DOWN-TROD**, or **-TRODDEN**, trampled down; oppressed. **DOWNWARD**, a. extending from a higher to a lower state or place; tending toward the earth. **DOWN'WARD**, or **DOWN'WARDS**, ad. *-wérdz*, in a descending course; from a higher to a lower state or place. *Note.*—Persons in London say, *down* to Scotland, etc., and those in the provinces, *up* to London; so in most countries *up* is toward the capital, and *down* is from the capital.

**DOWN**: maritime county in the s.e. of Ulster Province, Ireland; 51 m. long, 38 broad; 957 sq. m., five-sixths being arable, and one three-hundredth in wood. It has a coast-line of 67 m. (or 125 by the inlets), mostly low and rocky, and with many isles off it. The chief inlets are Belfast Lough, 3 m. broad, and 15 long; Strangford Lough,  $\frac{1}{2}$  to 3 miles broad, 10 m. long; Dundrum and Carlingford bays. The Mourne Mountains cover 90 sq. m. in the south, and rise 2,796 ft. in Slieve Donard. The other parts of D. are mostly undulating and hilly, with plains and fine meadows along the rivers. The chief rocks are Lower Silurian—covering most of the county—and granite, composing the Mourne and Croob mountains. The chief rivers are the Upper Bann and the Lagan. The Newry canal admits vessels of 50 tons, and with the Ulster Canal opens communication through almost all Ulster. Thick marl beds occur in the alluvial tracts. The soils are chiefly stony and clayey loams. In 1891 282,740 acres, out of the total 612,495, were in crop. The chief crops are oats, potatoes, turnips, wheat, flax, and barley. Many pigs are reared. The chief manufacture is linen, especially the finer fabrics, as muslin, woven in the houses of the small farmers. Flax and cotton mills have become common. Hosiery, leather, salt, thread, and woolens also are made. These, with corn, butter, pork, and hides, are the chief exports. D. is among the best cultivated Irish counties, and has more resident gentry (almost all Protestants, of English and Scotch descent) than any other Ulster county. It contains 10 baronies, 5 poor-law unions, and 70 parishes. The chief towns are Downpatrick, Newry, Newtownards, Bannbridge, and Donaghadee. Since 1885, the county of D. sends four members to parliament, besides one for the borough of Newry. D. has many ancient remains, as raths, round towers, castles, and abbeys. On the top of Slieve Croob (1,755 ft. high) are 23 stone cairns, one 54 ft. high. Presbyterianism prevails in the towns and low country, and Rom. Catholicism among the mountains and in the barony of Lecale. Pop. (1891) 267,059; of whom 106,289 Presb., 73,641 Rom. Cath., 65,162 Episc.; (1901) 205,889.

**DOWNES**, *downz*, JOHN: 1786–1855, Aug. 11; b. Canton, Mass.: naval officer. He entered the U. S. Navy as midshipman 1802, June; served on the *New York* in the war with Tripoli; was commissioned lieut. 1807, March; executive officer of the *Essex* under Capt. Porter 1812–14; promoted master-commandant 1813; commanded *Epervier* in the squadron under Com. Decatur operating against Algiers 1815, captured the Algerine frigate *Nashouda* June

## DOWNHAM MARKET—DOWNING.

17, and assisted in the capture of the brig *Estido* June 19, and was transferred to the *Guerrière* after peace. He was promoted capt. 1817, March; commanded the *Macedonia* 1819-21, the *Java* in the Mediterranean 1828-9, and the Pacific squadron 1832-34; nearly destroyed the village of Quallah Batoo, Sumatra, whose people had committed atrocities on American seamen 1832; and was in command of the navy-yard at Boston 1837-42 and 1850-52.—His son JOHN, A. D. (1822, Aug. 25—1865, Sep. 20), became a commander in the navy 1862, commanded the *Nahant* in the bombardment of Fort McAlister 1863, Mar. 3, and the attack upon Fort Sumter 1863, Apr. 7, aided in the capture of the Confederate iron-clad *Atlanta*, and died in command of the Gulf squadron.

**DOWNHAM MARKET:** town in the w. of Norfolk county, England; on a hillside, on the right bank of the Ouse, 40 m. w. of Norwich, 10½ s. of Lynn Regis. It lies amid fen and dairy land. Pop (1881) 2,631. It has a bell-foundry, and a celebrated butter-market. By the Ouse and Cam, small vessels proceed from Lynn on the coast to Cambridge, 30 m. above Downham Market. A market was confirmed here in the time of Edward the Confessor. Pop. (1881) 2,631; (1891) 2,537.

**DOWNING, ANDREW JACKSON:** 1815, Oct. 20—1852, July 28; b. Newburg, N. Y. He was bred to his father's occupation, nurseryman, attended the Montgomery Acad. a short time, and when 16 years old was placed with a brother in charge of the nursery. While so employed he began a systematic course of self-instruction, applying himself with keen interest to horticulture, botany, landscape-gardening, and the natural sciences. He visited all the fine estates within reach, wrote descriptions of rural scenery for the New York *Mirror*, exemplified his idea of a perfect rural home by building a grand house on his estate, inspected the chief country seats of England 1850, was engaged by the govt. to lay out and plant the public grounds of the U. S. Capitol, the White House, and the Smithsonian Institution 1851. He lost his life by drowning at the burning of the steamer *Henry Clay* on the Hudson river. He published *Treatise on the Theory and Practice of Landscape Gardening* (1841), *Cottage Residences* (1842), *Fruit and Fruit Trees of America* (1845), *Additional Notes and Hints to Persons about Building in the Country* (1849), *Architecture of Country Houses, including Designs for Cottages, Farm-houses, and Villas* (1850), and was editor of the *Albany Horticulturist* from 1846 till his death.

**DOWNING, Sir GEORGE:** 1624-84; b. Dublin: statesman. He accompanied his father to Salem, Mass., 1638, graduated at Harvard Univ. 1642, removed to England 1645, and after preaching some time among the Independents, and serving as a chaplain in Cromwell's army, became a member of parliament for a Scottish borough, 1654 and '56, and agent in Holland 1658-60. On the downfall of Cromwell he turned royalist, was knighted 1660, returned to parliament and reappointed envoy to Holland 1661, be-



## DOUR—DOUSA.

came recorder of deeds; and held that office till 1886, Apr. He was appointed secretary to the U. S. commission to San Domingo, 1871. He published *Narrative of My Experience in Slavery* (1844), *My Bondage and My Freedom* (1855), and *Life and Times of Frederick Douglass* (1881). He d. 1895, Feb. 20.

**DOUR**, or **DOURE**, a. *dór* [W. *dewr*, bold; L. *durus*, hard]: in *OE.*, sour-looking; sullen; in *Scot.*, hard and impenetrable in body or mind; sullen; bold; stern.

**DOUR**, *dór*: town of Belgium, province of Hainault, nine m. w.s.w. of Mons. It is well built and prosperous, and has several schools and a literary society. Coal and iron mines are worked in the vicinity; there are also many quarries, and there is some weaving, bleaching, and leather-dressing. Pop. (1891) 10,615.

**DOURA** (Millet): see **DURRA**.

**DOURO**, *dó'rô* (Span. *Dueño*, Port. *Doño*): one of the largest rivers of Spain and Portugal. It rises in the province of Old Castile, about 30 m. w.n.w. of the town of Soria. From its source it flows s.e. to Soria, then pursues a general w. direction till it reaches the Portuguese border; it then flows s.w., forming for about 60 m. the boundary between Spain and Portugal; then crossing Portugal and flowing w., it falls into the Atlantic below Oporto. Its Portuguese tributaries are comparatively small. Total length about 500 miles. The D. is a noble river, and flows through some of the most imposing rock-scenery in the world, as at Barca d'Alva; but is rapid, and of difficult navigation, on account of rocks, sand-banks, etc. It passes through a large portion of the wine-country of Portugal, whose produce it bears in flat-bottomed boats carrying from 30 to 70 pipes each, to Oporto for exportation.

**DOUROUCOLI**, *dó-rô-kó'li*: monkey, native of Brazil and Guiana, resembling a cat in appearance and when passive sitting up like a dog; body 9 inches long and covered with gray fur on back and brown on belly; tail 14 inches long. It received from Cuvier the name of *nocthora* from its habit of sleeping in the daytime and prowling in search of food at night. It is very fierce when awake, has a piercing, disagreeable voice, and is almost incapable of domestication.

**DOUSA**, *dow'sá*, **JANUS** (**JAN VAN DER DOES**): 1545, Dec. 6—1604, Oct. 8; b. Noordwyck, Holland: statesman and historian. He was educated at Lier, Delft, Louvain, Douai, and Paris; was among the nobles who formed a league against Philip II., 1565; was the head of an embassy to England 1572; and was intrusted with the govt. and defense of Leyden, when besieged by the Spaniards, 1574. When William I. of Orange founded the Leyden Univ., he appointed D. its first curator, and this office he held nearly 30 years. In 1584, he was sent to England to seek the aid of Queen Elizabeth, and appointed keeper of the Dutch archives, and 1591 removed to the Hague on being appointed a member of the states-general. He was the author of the *Annals of Holland*, printed in metrical form 1599 and



coast; broad ridges of elevated land near the sea, too light for cultivation, covered with close and fine turf; a flattish-topped hill. The name is applied specially to two broad ridges of undulating hills s. of the Thames, beginning in the middle of Hampshire, and running e., one (the North D.) through the middle of Surrey and Kent to Dover (about 120 m.), and the other (the South D.) through the s.e. of Hampshire and near the Sussex coast to Beachy Head (about 80 m.). Between the two ranges lies the valley of the Weald, from which the chalk strata are supposed to have been removed by denudation. Toward the Weald, the descent from both D. is rapid, and presents cliffs as of a sea-margin; while the opposite slopes are gradual. The highest point of the North D. is Botley Hill, 880 ft.; and of the South D., Ditchelling Beacon, 858 ft. These uplands are covered with fine short pasture, which, from its aromatic quality, forms excellent feeding-ground for the famous South Down sheep. The valleys among the hills are usually fertile, and admit of cultivation, so that an excellent field is furnished for mixed husbandry. By pasturing the sheep on the D. during the day, and folding them on the arable fields at night, the latter are fertilized.

DOWNS, *downz*, THE: important roadstead or shelter for shipping, off the s.e. coast of Kent, opposite Ramsgate and Deal, between N. and S. Foreland, and protected externally by the Goodwin Sands—a natural breakwater with one to four fathoms water, and often partly dry at low tide. This large natural harbor of refuge is eight m. by six, with an anchorage of four to twelve fathoms. It is resorted to temporarily by outward and homeward bound vessels, and squadrons of ships of war, and is unsafe only in south winds. It is defended by Deal, Dover, and Sandown castles. The Small Downs, an appendage of the Downs proper, lies inside the Brake Sand, has from  $2\frac{1}{2}$  to 5 fathoms water, and is about 2 m. wide.

DOWNTON: town in the s.e. of Wiltshire, England, on the right bank of the Avon, here divided into three branches; six m. s.e. of Salisbury. It consists chiefly of one long street with the houses irregularly placed. It has a paper-work, and an ancient cross. D., in the middle ages, had a castle, of which the mound or moat remains, and is a singular earthwork, on which Saxon justice was dispensed. Two m. n. of D. is the mansion and estate of Standlinch, the national gift to the heirs of Lord Nelson, for which parliament voted £100,000. Pop. of D. (1881) 4,713. (1891) 6,136

DOWNY, a.: see under Down 1.

DOW-PURSE, n.; a considerable sum of money anciently put into a purse and presented at the wedding by the bridegroom to the bride.

DOWRY, n.: see under DOWER.

DOWSE, v. *dows*: see DOUSE.

DOXIE a. *dōks'z* [Icel. *dosk*, inactivity]: in Scot. lazy; restive

## DOXOLOGY—DOZE.

**DOXOLOGY**, n. *dōks-ōl'ō-jī*: [Gr. *dōxōlōgīā*, giving glory—from *doxa*, praise, glory; *logos*, a word]: a hymn or prayer ascribing praise to God; solemn form of giving glory to God, such as the apostle Paul uses at the close of his epistles, and sometimes even in the middle of an argument (Rom. ix. 5). The hymn of the angels (Luke ii. 14) also is called a doxology; likewise is the close of the 'Lord's Prayer.' The so-called 'Great Doxology' is simply an expansion of the angelic hymn of Luke ii. 14, and is sung in the Rom. Cath. Church at the celebration of the Lord's Supper, and at matins. It commences with the words, *Gloria in excelsis Deo* ('Glory to God in the highest'). The ordinary doxology (*Gloria Patri*) 'Glory be to the Father, and to the Son, and to the Holy Ghost, as it was,' etc., is repeated at the end of each psalm in the service of the Church of England. There are numerous doxologies in verse to suit different metres. **DOXOL'OGIZE**, v. *-jīz*, to give glory to God. **DOXOL'OGIZING** imp. **DOXOL'OGIZED**, pp. *-jīzd*. **DOX'OLOG'ICAL**, a. *-lōj-ī-kāl*, pertaining to doxology; giving praise to God.

**DOXY**, or **DOXIE**, n. *dōks'ī* [perhaps a corruption of *ducksy*, a dim. of *duck*, a dear: comp. F. *doux*, sweet, soft]: in *cant* and *slang*, the female companion of a tramp, gypsy, beggar, or thief; in *OE.*, a lady-love; a mistress; a sweetheart; in *prov. Eng.*, a little girl, in a familiar and endearing sense. *Note*.—**DOXY** may have been introduced from the Netherlands. We have *docka*, a doll: Fris. *dokke*, a doll; *doktje*, a small bundle; comp. **DUCK**, a dear, a darling.

**DOYLE**, *doyl* **A CONAN**, M.D.: British novelist: 1859, May 22———; b. Edinburgh. After studying at Stonyhurst college, Lancashire, he entered Edinburgh Univ., graduating 1881. His training was for the medical profession, but his tastes early drew him into literature, in which his success was brilliant. He made a tour of U. S., 1895, and in the summer of 1896 was war correspondent for the *Westminster Gazette* with the Eng. army in the Soudan. Among his tales are: *Micah Clarke* (1889); *A Study in Scarlet* (1890); *The Firm of Girdlestone* (1890); *The White Company* (1891); *Captain of the Polestar* (1892); *The Adventures of Sherlock Holmes* (1892); *The Refugees* (1893); *The Sign of Four* (1893) *The Memoirs of Sherlock Holmes* (1894); *The Stark Munro Letters* (1895).

**DOYLE**, *doyl*, **RICHARD**: Eng. caricaturist: 1826–1883, Dec. 11; b. London. He became a contributor to *Punch*, but withdrew 1850 because of its criticisms of the Rom. Cath. Church, of which he was a member. His book illustrations were admirable, the best being *Adventures of Brown, Jones, and Robinson*, and of the *Newcomes*. his caricatures show genial humor and graceful drawing.

**DOYLT**, or **DOILT**, a. *doylt* [Gael. *doillead*, darkness, blindness]: in *Scot.*, stupid; stupefied; crazed: see **DOLT**.

**DOZE**, v. *dōz* [Icel. *dusa*, to doze: Bav. *dosen*, to keep still: Dan. *dose*, to doze, to mope: comp. Gael. *dusal*, sleep]: to be half asleep; to be drowsy; to sleep lightly: N. a light sleep. **DO'ZING**, imp. **DOZED**, pp. *-dōzd*. **DO'ZER**, n. one

## DOZEN—DRACÆNA.

who. **DOZY**, a. *dō'zī*, sleepy; drowsy. **DO'ZINESS**, n. *-zī-nēs*, drowsiness.

**DOZEN**, a. *dūz'n* [OF. *dozaine*: F. *douzaine*—from F. *douze*; OF. *doze*, twelve—from mid. L. *dozēnā*, a dozen—from L. *dūōdēcīm*, twelve]: twelve in number of the same kind: N. twelve of things of a like kind.

**DOZY**, *do-zī'* or *dō'zī*, **REINHART**: 1820, Feb. 21—1883, June 3; b. Leyden: learned orientalist. He studied at the univ. of his native town, and applied himself to oriental studies. In 1850 he was appointed extraordinary, and, in 1857, ordinary prof. of history at Leyden. D. published the *Historia Abbadidarum* (1852), and editions of Mar-rékoshi's *History of the Almohades* (1847), of Ibn-Badrūn's *Historical Commentary on the Poem of Ibn-Abdun* (1848), and of Ibn-Adhari's *History of Africa and Spain* (1848-52). In 1849 appeared his masterly performance, *Recherches sur l'Histoire politique et littéraire de l'Espagne pendant le Moyen Age*. A second edition, enlarged and completely recast, was published 1860. In this work, D. has exposed the gross and wilful corruptions of the monkish chroniclers, who persisted in needlessly falsifying history for the benefit of Christianity, and who could form no more rational idea of the Moors than that they were 'devils,' or abetted by the devil, and sent to torment the Spaniards because of their *sins*. Other valuable productions of D. are his *Al-Makkarī*, *Analectes sur l'Histoire et la Littérature des Arabes d'Espagne* (Leyd. 1855-61); *Histoire des Musulmans d'Espagne jusqu'à la Conquête de l'Andalousie par les Almoravides* (Leyd. 1861); *Het Islamisme* (Harl. 1863), and *Die Israeliten zu Mekka* (1864).

**DRAB**, a. *drāb* [F. *drap*—from It. *drappo*, cloth—from mid. L. *drappum*]: of a pale-brownish color: N. a kind of thick woolen cloth of a color approaching the dry mud of a road. **DRAB-COLORED**, having the color of drab.

**DRAB**, n. *drāb* [Dut. *drabbe*; Dan. *drav*; Gael. *drabh*, *draff*, dregs: Gael. *drabhas*, filth, dirt—from *drab*, a spot, a stain]: an untidy, dirty woman; a prostitute. **DRAB'BER**, n. one who associates with drabs. **DRAB'BISH**, a. having the character of a drab. **DRABBLE**, v. *drāb'l*, to cover with filth. **DRABBLER**, n. *naut.*, a piece of canvas laced on the bonnet of a sail, being an extension of the bonnet, as the latter is of the sail.

**DRABA**, n. *drā'ba*: in *bot.* Whitlow grass, genus of Crucifers, family *Alyssidæ*. The fruit is an oval or oblong silicle, compressed or with the valves slightly convex, one-nerved at the base, nerved or veined upward, with many seeds.

**DRABS**, n. *drābz* [Gael. *drabhas*, dregs, *draff*]: in *salt-works*, a kind of wooden box for holding the salt when taken out of the boiling-pan.

**DRACÆNA**, n. *drā-sē'nă* [Gr. *drakaina*, a she-dragon]: a genus of very fine ornamental-foliaged trees, ord. *Liliacæ*, whose inspissated juice is said to become a powder like dragon's blood: see **DRAGON'S BLOOD**.



## DRACANTH--DRACO.

**DRACANTH:** see **TRAGACANTH**.

**DRACHENFELS**, *drá'chén-fěls* ('Dragon's Rock') mountain on the Rhine, one of the range called the *Sieben-gebirge*; renowned through Byron's verses commencing

The castled crag of Drachenfels  
Frowns o'er the wide and winding Rhine.

It is on the right bank of the river, about eight m. s.e. of Bonn, and has an elevation of 1,056 ft. It is of volcanic origin, consisting of lava, trachyte, and basalt. D. rises abruptly from the river, and is covered with brushwood almost to the top, whence the prospect is magnificent, extending down the river as far as Cologne, and having a charming foreground in Bonn, with its university, and numerous villages, and time-worn castles. The cave where the legendary dragon—from which the mountain takes its name—was wont to abide, is pointed out to the traveller. The ruins of an old castle crown the summit, and add picturesqueness to the Drachenfels.

**DRACHM**, n. *drām* [Gr. *drachmē*, an anc. coin, about 9¼d.: L. *drachma*]: the eighth part of an ounce; three scruples; a weight used by apothecaries—usually written **DRAM**, which see.—The *drachma* was a silver coin, the unit of the money-system in ancient Greece. It varied in value in different parts of Greece and at different times. The Attic drachma is estimated as equivalent to 9¼d. sterling, very nearly a French franc. The Æginetan drachma was considerably more. But whatever its absolute worth, it always remained the 6,000th part of the *talent* (about £244, or \$1,188.28) and the 100th part of the *mina* (about £4, or \$19.00) and was divided into six obols. There were also coins of two, three, and four drachmas. The drachma (originally *a handful*) was also the name of a weight, and 100 drachmas made a mina, in weight, as in money. The weight of the drachma is stated at from ½oz. avoirdupois to little more than half as much. At this lowest estimate, the mina = 1 lb. nearly. The unit in the monetary system of modern Greece, since 1833, has also been called *drachma*; it is equivalent to  $\frac{88}{100}$  of a franc, or about 8½d. sterling (abt. 17 cents) and is divided into 100 lepta. In the British system of weights there were, till recently, two drachms or drams: the avoirdupois *dram*—equal to  $27\frac{1}{2}$  troy grains—and the apothecaries' *dram* (not now used), equal to 60 troy grains, or  $\frac{1}{8}$  of an ounce troy. It is this last which is the representative of the ancient drachma.

**DRACINA**, n. *dra-sī'na*, or **DRACINE**, n. *drā'sīn* [Gr. *drakaina*, a she-dragon]: in *chem.*, the resin obtained on the addition of sulphuric or hydrochloric acid to a solution of dragon's blood in alcohol.

**DRACO** [Gr. *drakon*, a dragon]: a kind of luminous exhalation, or *ignis fatuus*, arising from marshy places.

**DRACO**, *drā'kō* [Gr. *Drakon*]: Athenian lawgiver and archon, who, B.C. 624, was appointed to draw up new laws for the disordered state. These, however, effected little change in the form of the state; but by being committed

## DRACO—DRACONTIUM.

to writing, put an end to the arbitrary administration of justice on the part of the archons, and resulted in the establishment of a court of appeal—that of the Ephetæ. D.'s legislation had a beneficial and permanent effect upon the political development of Athens. The extraordinary severity of these laws, however, which punished the slightest theft, or even laziness, with death, no less than sacrilege, murder, and treason, caused them to be often neglected, and made them so hated, that Solon was appointed to draw a new code. Solon, though he softened their severity in most instances, retained that law which punished a murderer with death. D., at a later period, went to Ægina, where, after having introduced his laws, he is said to have been stifled in the theatre by the garments thrown upon him as a mark of respect by the people. The severity of his laws gave rise to a pun by Herodicus, who declared that D.'s laws were those of a dragon (Gr. *drakon*) and not of a man. Hence also originated the metaphorical remark of Demades, 'that they were written not in ink but in blood.' DRACONIAN, a *dră-kō'nī-ăn*, or DRACON'IC, -*kōn'ik*, pertaining to Draco or his laws; mercilessly severe.

DRA'CO: constellation in the n. hemisphere. The star  $\gamma$  Draconis is notable as the one used in determining the co-efficient of aberration of the fixed stars. It is a bright star, nearly in the solstitial colure; consequently the minor axis of the small ellipse which its apparent place describes in the heavens, lies in the meridian at its transit. Moreover, at the two equinoxes, when its apparent place is at the extremities respectively of this minor axis, it can be observed on the meridian at one equinox about sunrise, and at the other about sunset, so that both observations, may be made without the interference of a too bright day-light. These two observations, therefore, are easily taken, and the difference in the north polar distance which they give, is the minor axis of the ellipse described by the apparent place of the stars.

DRACOCEPHALUM, n. *dră-kō-sěf'a-lŭm* [Gr. *drakon*, a dragon; *kephale*, a head]: in bot., dragon's-head; a genus of annual and perennial plants belonging to the order *Labiata*. *D. canariense* is the Canary balm of Gilead. The plants are odoriferous, and are natives of Europe, Asia, and America.

DRACONIDÆ, n. *dră-kōn'ī-dē* [L. *draco*, a dragon; and adj. suff. *idæ*]: in zool., in some classifications, a family of lizards, type Draco. It is generally, however, merged in the *Agamidæ*. DRACONINÆ, n. *dră-kōn-ī'nē*, sub-family of *Agamidæ*, type Draco.

DRACON'INE: see DRACINA.

DRACONTIUM, *dră-kōn'shī-ŭm*: genus of plants of the nat. ord. *Araceæ*, of which one species, *D. polypkyllum*, native of Guiana, Surinam, also of India and Japan, has a powerful action on the nervous system, and is useful in asthma; though at present its chief reputation is the doubtful one of curing the bite of a snake, to which its mottled



## DRACUNCULÆ—DRAG.

stem gives it some resemblance. The flower, when it first expands, emits an intolerable stench: see DRAGON, GREEN.

DRACUNCULÆ, n. *drā-kūng-kū'lē-ē* [L. *dracunculus*, and adj. suff. *æ.*]: in *bot.*, a tribe of *Araceæ*; stamens and pistils numerous, with the rudimentary organs interposed; spadix naked at the extremity; cells of the anthers larger than the connective..

DRACUNCULUS (plant): see DRACONTIUM.

DRACUNCULUS (fish): see DRAGONET.

DRAFF, n. *drif* [AS. and Dut. *drabbe*; Dan. *drav*; Icel. *dráf*, dregs, husks: Gael. *drabh*, grains of malt after brewing (see DRAB 2)]: the refuse malt after the liquor has been drawn off, used for the feeding of cows and swine; dregs; sweepings. DRAF'FY, a. *-fī*, or DRAF'FISH, a. *-fīsh*, worthless; dreggy.

DRAFT, n. *drāft* [corrupted from *draught*, *drag*, or *draw*—*lit.*, that which is drawn]: a body of men taken or drawn from an army or any part of it, or from a district; a detachment of soldiers; a check or order on a bank or other debtor for money; a bill of exchange; a sketch; an outline or plan on paper; depth of water requisite to float a vessel (see DRAUGHT); tentative copy of a legal document, or other formal writing, made for the purpose of adjusting the matter afterward to be admitted into the fair copy, or engrossed, as it is called; thus in manuscripts and proof-sheets are the drafts of printed works; in *hydraul. engin.*, the combined sectional area of the openings in a turbine water-wheel; or the area of opening of the sluice-gate of a fore-bay: V. to draw men from a body of soldiers for service elsewhere; to select or detach; to draw out a rough sketch of a written document; to draw out and write, as a legal document; to draw out or delineate. DRAFT'ING, imp. DRAFT'ED, pp.

DRAFTS, n.: see DRAUGHT.

DRAFTSMAN, n.: same as DRAUGHTSMAN, which see.

DRAG, v. *dräg* [AS. *dragan*; Icel. *draga*, to drag or draw; Dut. *draghen*; Ger. *tragen*, to carry]: to draw along heavily or slowly; to pull by main force; to pull forcibly or roughly; to draw a body along at the bottom, as of a river or other water; to hang so low as to trail on the ground: N. something drawn along the ground to impede or catch; an apparatus for searching among water for drowned persons, etc., an instrument for retarding the motion of carriage-wheels when going down-hill; anything that retards or hinders; an obstacle to progress; a kind of cart drawn by the hand; a kind of heavy coach, a rough heavy sledge, as a *stone drag*; in *agri.*, a heavy kind of harrow; *naut.*, a floating anchor, usually a frame of spars and sails, to keep a ship's head to the wind, and lessen the speed of drifting; a four-horse vehicle used by sporting characters; in *mold.*, the bottom part of a mold, as distinguished from the cope; in *marine engin.*, the difference between the speed of a screw-ship under sail, and that of the screw when the ship outruns the latter; the difference between the propulsive effects of the different



## DRAG.

floats of a paddle-wheel; in *fishery*, a frame of iron with an attached net to scrape up and gather oysters by dragging upon the bed; in *mus.*, an ornament consisting of descending notes in lute music; a *rallentando*. DRAG'GING, imp. DRAGGED, pp. *drägd*. DRAG-ANCHOR, n. *naut.*, a frame of wood, or of spars clothed with sails, attached to a hawser, and thrown overboard to drag in the water and diminish the leeway of a vessel when drifting, or to keep the head of a ship to the wind when unmanageable through loss of sails or rudder. DRAG BAR, n. in *railroad engin.*, strong iron rod with eye-holes at each end, connecting a locomotive-engine and tender by means of the drag-bolt and drag-spring. DRAG-BOLT, n. the strong removable bolt coupling the drag-bar of a locomotive engine and tender. DRAG-HUNT, n. name given to a hunt when the trail has been prepared beforehand along a certain course, by means of dragging a herring or other strongly scented substance over the line. DRAG-LINK, n. link for connecting the cranks of two shafts; it is used in marine engines for connecting the crank on the main-shaft to that on the inner paddle shaft. DRAG-SAW, n. a cross-cut sawing-machine in which the effective stroke is on the pull motion, not the thrust. The log is clamped by levers. The saw is held aloft by a stirrup while the log is fed forward for another cut. DRAG-SHEET, n. *naut.*, a sail stretched by spars and thrown over to windward to drag in the water and lessen the leeway of a drifting vessel. DRAG-STAFF, n., a pole pivoted to the hind axle and trailing behind a wagon or cart in ascending a hill or slope; used to hold the vehicle from rolling backward when temporarily stopping on a hill to rest the team. TO DRAG AN ANCHOR, to trail it along the bottom when the anchor will not hold the ship. DRAG-NET, a net to be drawn along the bottom of a river or pond. —SYN. of 'drag, v.': to pull; draw; haul; tug; pluck; harrow.

DRAG: mechanical contrivance for retarding motion; formerly used on team wagons, coaches, and private carriages; made in the form of an open shoe, which, when in use, was placed in front of one of the rear wheels causing it to slide upon the ground, thus retarding the progress of the vehicle and enabling the horses to go more easily and safely down steep hills. A brake, affecting both the rear wheels and by means of a lever easily and instantly applied by the driver without leaving his seat, has almost entirely superseded this inconvenient arrangement.

DRAG, in Agriculture: a harrow, consisting of a very heavy wooden frame, usually triangular, with long, large, and pointed iron teeth, or tines; used for breaking up the clods and pulverizing and levelling the surface of plowed fields. It dates from an early period, and is one of the rudest implements of its class. Was formerly in extensive use in England and Scotland, also in this country until toward the middle of the present century. It is still occasionally employed in preparing for cultivation land recently cleared of forests and in working very rough fields and heavy soils. It is not suitable for light lands or for covering seeds, and wherever used needs to be followed by

## DRAGANTINE—DRAGOMAN.

a harrow with smaller teeth. The drag is unwieldy to handle, is very slow in operation, requires a powerful team, and is far less efficient than the lighter, and more scientifically constructed modern implements which have almost wholly taken its place.

DRAGANTINE, n. *dra-găn'tîn*: a mucilage made from gum-tragacanth: see TRAGACANTH.

DRAGGLE, v. *dräg'l* [same as *drabble*: Scot. *draglit*, be-dirtied, bespattered: Sw. *dragla*, to drivel, to let spittle fall from the mouth: used as a frequentative of DRAG]: to wet and dirty by drawing along wet muddy ground, or wet grass. DRAG'GLING, imp. DRAGGLED, pp. *dräg'ld*: ADJ. dirtied by being drawn over mud. DRAGGLE-TAILED, slatternly, as one who drags the skirt of her gown through the mire; untidy.

DRAGOMAN, n. *dräg'ö-măn*, DRAG'OMANS, n. plu. [F. and Sp. *dragoman*; Ar. *tardjumân*, a dragoman: Chald. *targêm*, to explain; *targûm*, explanation, interpretation—probably this word was introduced from Constantinople by the Crusaders, borrowed from the mediæval Greek word *dragou'manos*, an interpreter]: interpreter in Turkey, and other eastern lands, or a guide to foreigners. The common D. corresponds exactly to the Italian *cicerone*, or the French *commissionnaire* or *valet de place*. There are several connected with hotels at Constantinople and other Turkish cities, who eagerly address European travellers, offering to perform every imaginable service. The diplomatic dragomen are, however, important personages, being the medium of communication between the Christian ambassadors and the Sublime Porte. Though usually natives, they and their families have the privilege of being under the protection of the embassy that they serve, and are subject to the laws of the country of that embassy, and not to the Turkish law. This privilege, which pertains also to all the subjects of the great Christian powers resident in Constantinople, etc., is much valued, on account of the greater severity of the Turkish laws, and the summary manner in which they are executed. These dragomen are mostly of Italian extraction, either descendants of the old Genoese and Venetian merchants or Maltese. Strange stories are told of their tricks in garbling the communications that they have to make, when private interests can be served by such means, and bribes obtained; and there is no doubt that newly appointed consuls, quite ignorant of the Turkish language, are in some respects almost completely in their power, and that this power is frequently used unscrupulously.

## DRAGON.

**DRAGON**, n. *drǎg'ōn* [F. *dragon*—from Gr. *drakōn*; L. *drācōnem*, a serpent—from Gr. *drakein*, to see, to flash—from its supposed sharpness of sight: comp. Gael. *drag*, fire, a fiery meteor] a fabulous winged creature vomiting fire; a genus of reptiles of the E. Indies; a constellation; in *Scot.*, a paper kite; a serpent; in *Scrip.*, the Devil. **DRAGON**, n. *milit.*, a short musket hooked on to a swivel attached to a soldier's belt; so called, according to Meyrick, from a representation of that monster's head at the muzzle (the old fable being that the dragon spouted fire). The soldiers who carried these arms were thence called dragoons (q.v.). **DRAG'ONISH**, a. *-n'ish* or, **DRAGON-LIKE**, in the form of a dragon; like a dragon. **DRAG'ONET**, n. *-ō-nēt*, a little dragon; a small kind of sea-fish. **DRAGONNADE**: see **DRAGON**.—**DRAGON-SHELL**, n. *conchol.*, name given to a species of patella or limpet, *Cypræ stolidæ*. **DRAGON'S-SKIN**, a familiar name among miners and quarrymen for certain fossil stems whose leaf-scars somewhat resemble the scales of reptiles. **DRAGON'S-TEETH**, matters which cause, or may cause, civil strife—in allusion to the dragon's teeth sown by Cadmus, which produced men who killed each other, only five men remaining. **DRAGON'S HEAD AND TAIL**, in *astron.*, the nodes of the planets, or the two points in which the orbits of the planets intercept the ecliptic.

**DRAG'ON**: name applied in modern nat. history, both popularly and by scientific authors, to different kinds of saurian reptiles. Some of these (the genus *Draco* of Lin



Fringed Dragon (*Draco fimbriatus*).

næus) are remarkably characterized by false ribs extending from the sides, so as to support a membrane which is used as a parachute. These are called flying Dragons (q.v.) or flying lizards. Another reptile which has received the



## DRAGON.

name D., and is called also D. LIZARD (*Ada*), belongs to a family of saurians, *Teyidæ*, found only in America, closely allied to the *Varanidæ* of the Old World, and to which, in common with them, the names MONITOR and SAFEGUARD have sometimes been given, in consequence of their being supposed—though erroneously—to give warning by a hiss of the proximity of a crocodile or aligator. It inhabits the marshy plains of Guiana, climbs trees with facility, bites severely, has a long compressed tail, the back and tail crested, the tongue forked like that of a serpent, and attains a length of about 6 ft. Both its flesh and eggs are used as food.

DRAGON: in the mythical history and legendary poetry of almost every nation, the emblem of the destructive and anarchic principle, as it manifests itself in the earlier stages of society—specially as misdirected physical power and untamable animal passion. Like the serpent, the D.



St. George and the Dragon.

is always a minister of evil, of the principle which aims at negation, opposition, and contradiction, the object of which is to fight against order, harmony, and progress. But while the serpent seeks the attainment of its object by cunning and deceitful artifices—crawling on its belly, and always assuming ostensibly characteristics opposite to its own—the D. proceeds openly, running on its feet, with expanded wings, and head and tail erect, violently and ruthlessly outraging decency and propriety, spouting fire and fury

## DRAGON.

from both mouth and tail, and wasting and devastating the whole land. The destruction of the disorderly element thus symbolized was one of the first objects of human energy, but it was an object unattainable by merely human means, and mankind were accordingly indebted for its accomplishment to that intermediate class of beings known in classical antiquity as heroes. As the highest ideal of human strength and courage, the task properly fell to Hercules; but it was not confined to him, for we find both Apollo and Perseus represented as dragon-slayers. From legendary poetry, the D. passed into art, some of the earliest efforts of which probably consisted in depicting it on the shield, or carving it for the crest of a conqueror's helmet. The D. does not seem to have been a native emblem with the Romans, and when they ultimately adopted it as a sort of subordinate symbol, the eagle still holding the first place, it seems to have been in consequence of their intercourse with nations either of Pelasgic or Teutonic race. Among all the new races which overran Europe at the close of the classical period, the D. seems to have occupied nearly the same place that it held in the earlier stages of Greek life. In the *Nibelungen Lied*, we find Siegfried killing a D. at Worms; and the contest of Beowulf (q.v.), first with the monster Grendel, and then with the D., forms the principal incident in the curious epic which bears the name of the former. Thor himself was a slayer of dragons (J. Grimm, *Deutsche Mythologie*, ii. 653). Among the Teutonic tribes which settled in England, it was from the first depicted on their shields and banners; and Dr. Plott, in his *History of Oxfordshire*, ascribes the origin of the very ancient custom of carrying the D. in procession at Burford, in great jollity, on Midsummer Eve, to the fact of a banner adorned with a golden D. having been taken by a king of the W. Saxons from a king of Mercia. The custom, however, is said by Brand, on the authority of Aubanus, to have prevailed in Germany, and was probably common in other parts of England (Brand's *Pop. Antiq.* i. 321). Nor was the D. peculiar to the Teutonic races. Among the Celts, it was the emblem of sovereignty, and as such borne as the sovereign's crest. Mr. Tennyson's *Idylls* have made every one familiar with 'the dragon of the Great Pendragonship,' blazing on Arthur's helmet, as he rode forth to his last battle, and 'making all the night a stream of fire.'

The fiery D., or Drake, and the flying D. in the air, were meteoric phenomena, of which we have frequent accounts in old books, and, indeed, as Brand remarks, 'the dragon is one of those shapes which fear has created to itself,' and which appears in circumstances, and clothes itself in forms, as various as our fears.

In Christian art, the D. is the personification of godlessness and the evil power, the usual form given it being that of a winged crocodile. It is often represented as crushed under the feet of saints and martyrs, and other holy personages. Sometimes its prostrate attitude signifies



## DRAGON—DRAGON-FLY.

the triumph of Christianity over paganism, as in pictures of St. George and St. Sylvester; or over heresy and schism, as when it was adopted as the emblem of the Knights of the order of the D. in Hungary, which was instituted for the purpose of contending against the adherents of John Huss and Jerome of Prague.

The D. is often employed in heraldry; and other animals, such as the lion, are sometimes represented with the hinder parts resembling dragons. An animal so represented is said to *dragonné*: see GRIFFIN. A D. without wings is called a lindworm, or lintworm, which Grimm (*Deutsche Mythol.* II. 652) explains to mean a beautiful or shining worm.

DRAG'ON, GREEN (*Dracunculus vulgaris*): plant of the nat. ord. *Araceæ*, which receives its name from its spotted stem; native of the south of Europe. Its flowers are black, remarkably fetid, and give out exhalations which cause headache, giddiness, and vomiting. The root is emetic, and, probably for no better reason than the peculiar appearance of the stem, has been supposed useful for curing serpent-bites. See DRACONTIUM.

DRAGONET, *drăg'on-ët* (*Callionymus*): genus of fishes



Gemmeous Dragonet (*Callionymus lyra*).

of the Goby (q.v.) family (*Gobiadæ*), remarkable for having the gill-openings reduced to a small hole on each side of the nape, and the ventral fins placed under the throat, separate, and larger than the pectorals. They have no air-bladder. The species are numerous; most of them finely colored, as the GEMMEOUS D. (*C. lyra*) of the British coasts—called *Gowdie* (*gowd*, gold) in Scotland—a fish 10 or 12 inches long, the prevailing yellow color of which is varied with spots of sapphirine blue, etc.

DRAG'ON-FLY (*Libellula*): a Linnæan genus of neuropterous insects, now constituting the family *Libellulidæ*. They are in general very beautiful, rivalling butterflies in their hues, and like them loving the sunshine. They are, however, easily distinguished from butterflies, even at a distance, by their more slender form and comparatively



## DRAGON-FLY.

narrow gauze-like wings; and differ from them still more widely in their habits, as they do not feed on the nectar of flowers, but prey on other insects, which they pursue with rapid flight. Dragon-flies have a large head; the mouth is formed for mastication, and its parts, especially the mandibles, possess great strength.—See COLEOPTERA, for an explanation of the structure of the mouth in *masticating* insects, and the names of its parts.—The antennæ are short, awl-shaped, and of few joints. The eyes are large, lateral, and projecting. The wings—four in number—are equal in size, or nearly so, long, very thin, and very much reticulated. The legs are short. The abdomen in some is compressed, in others slender and cylindrical, in some remarkable for its extreme slenderness. The French name *demoiselle*, given to these insects, seems due to their beauty. They are remarkable equally for their voracity. The Great D. (*Aeshna grandis*), an insect about four inches long, largest British species, has been seen to dart upon a large



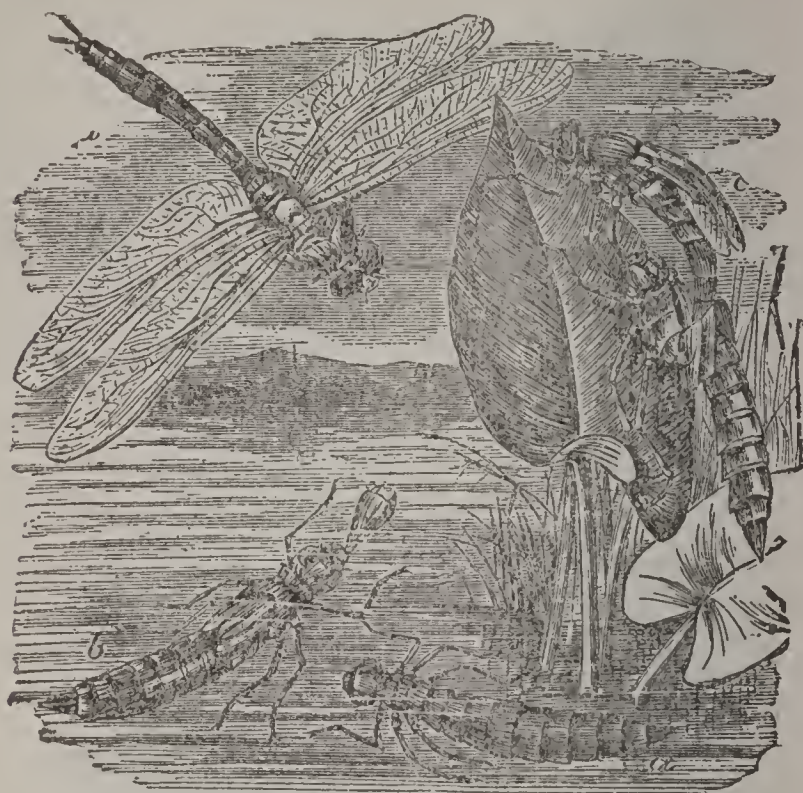
Dragon-fly and Nymph (*Libellula depressa*).

cabbage-butterfly which passed as it was flitting up and down in search of prey; and then settling on a twig, it bit off the wings, and in less than a minute devoured the body.

Dragon-flies are usually most abundant in the vicinity of lakes, rivers, and marshes. They deposit their eggs in water, and the larvæ and pupæ are entirely aquatic, living chiefly at the bottom of the water, and creeping on the submerged parts of aquatic plants. They are as ravenous as the perfect insect, which in general form they resemble; aquatic insects are their food. The pupæ, unlike those of the greater number of insects, are active. They are provided with the means of drawing water into their bodies to supply air for respiration, and expel it again by the same orifice at the extremity of the abdomen, with such force, that they thus propel themselves through the water, while their legs are at rest. When the final transformation is

## DRAGONNÉE—DRAGON'S BLOOD.

about to take place, the D. pupa crawls out of the water on a stick, rush, or other object; fixes itself by hooks, with which its legs are furnished; and the skin then splitting at the back, the perfect insect comes forth, but with body and wings quite soft and moist, and the wings still folded up into small compass. In the sub-family *Agrioninae*, the wings



Metamorphoses of Dragon-fly (*Aeshna grandis*):

a, larva; b, pupa; c, perfect insect issuing from pupa case; d, perfect insect, with wings fully developed.

are vertical in repose; different species are red, blue, green, etc. In the *Aeschninae*, common Amer. species are *L. tri maculata*, and *quadrifasciata*, named from smoky wing spots. *Aeschna heros* is very large, the body green-striped.

**DRAGONNÉE**, a. *dră-gŏn' nă* [F.]: in *her.*, a term applied to a lion or other beast when the upper part resembles a lion and the under part the wings and tail of a dragon.

**DRAG'ON ROOT** or **GREEN DRAGON** (*Arisæma dracon- tium*): American plant of ord. *Araceæ*, differing from Indian Turnip (*A. triphyllum*, in 7-11 divided leaf, the root of which, and perhaps of this, was used to stimulate secretions in chronic ills. The powder, made into paste with honey, was sometimes applied to the mouths and throats of children in aphthæ; and milk, in which the root has been boiled, was used as an ointment for scald-head, ringworm, etc.

**DRAG'ON'S BLOOD**, (called sometimes Gum Dragon): astringent, resinous substance, obtained from several trees of different nat. orders, natives of warm countries. The greater part of the D. B. of commerce is probably the produce of *Pterocarpus Draco*, a large S. American tree of



## DRAGON'S BLOOD.

the nat. ord *Leguminosæ*, sub-order *Papilionaceæ*, which at some seasons appears as a magnificent mass of yellow bloom. A similar substance is yielded in the E. Indies, by the red sandal-wood tree (*Pterocarpus santalinus*); and *Dalbergia monetaria*, a tree of the same order, yields it in Guiana. Mexican D. B., used in Mexico as a vulnerary and astringent, is obtained from *Croton Draco* (see CROTON), of the nat. ord. *Euphorbiaceæ*. The best kind of all is supposed to be produced by *Calamus Draco*, an E. Indian palm, and part of it is said to be obtained from the fruit of the



Dragon Tree (*Dracæna Draco*).

palm.—D. B. exudes from the surface of the leaves, and from cracks in the stem of the DRAGON TREE (*Dracæna Draco*), a tree of the nat. ord. *Liliacææ*, remarkable for the size which it sometimes attains, rivalling even the baobab, and of which a celebrated specimen near Orotava in the island of Tenerife was found by Humboldt 1799 to have a stem about 45 ft. in circumference, and is described as having been of similar gigantic size in the beginning of the 15th c. The stem of the dragon tree is, however, generally short in proportion to its thickness, and its head consists of numerous short branches, terminating in tufts of sword-shaped leaves. It is not supposed to yield any of the D. B. of commerce.

D. B. is opaque, of deep reddish-brown color, brittle, smooth, with a shining shell-like fracture, and when burned,



## DRAGON'S MOUTH—DRAGOON.

emits an odor resembling that of benzoin. It is nearly insoluble in water, but is soluble in alcohol, and the solution will permanently stain heated marble, for which it is often used, as well as for staining leather and wood. It is also soluble in oils and turpentine, and enters into the composition of brilliant and much-esteemed varnishes. It was used formerly in medicine, but is now almost out of use.—An astringent resin obtained from the *Eucalyptus resinifera* of Australia is there called Dragon's Blood.

DRAGON'S MOUTH (or, in Spanish, BOCA DEL DRAGO): strait in S. America, separating Trinidad from the mainland, and connecting the Gulf of Paria with the s.e. extremity of the Caribbean Sea.

DRAGON'S MOUTH: name also of a strait in Central America, on the n.e. coast of Veragua, the most n.w. portion of New Granada, and it communicates between the Caribbean Sea and Lake Chiriqui.

DRAGOON, n. *dră-gôn'* [OE. *dragon*, a species of carbine used by soldiers, who could serve on horseback or on foot: F. and Sp. *dragon*, a dragon, a horse soldier—from L. *dracōnem*, a dragoon (see DRAGON)]: a horse soldier, originally trained to act on foot also; a cavalry soldier. V. to force; to harass; to persecute; to use violent measures to obtain an object. DRAGOONING, imp. DRAGOONED, pp. *-gônd'*. DRAGONADE, n. *drăg' ū-năd'*, also DRAGONNADE, n. *drăg' ōn-năd'*, the giving up a place to the violence of soldiers; applied particularly to the merciless persecutions instituted under Louis XIV. and his successor against the French Protestants to compel their conversion. The Dragonnades consisted of armed expeditions, led by a bishop, an intendant a sub-delegate, or a priest, who marched through the provinces, demanding of the heretics that they should abjure their faith, and leaving such as were refractory to be dealt with by the unscrupulous troops. Foremost among the armed force rode dragoons, who, from the fact of their taking the precedence, and from the merciless treatment to which they subjected the Protestants, had the unenviable honor of giving a name to the persecutions. Louis XIV., who had been entirely misinformed as to the means employed in the D. by the courtiers and fanatics who surrounded his throne, was delighted to find that from 250 to 400 Protestants were daily being received into the bosom of the church, and in consequence, 1685, Oct. 22, a few months after the date of the first of the D., he revoked the Edict of Nantes (q.v.), that the good work might be completed.

DRAGOON', in Military: cavalry soldier. From the old fable that the dragon spouts fire, the head of the monster was worked upon the muzzles of a peculiar kind of short muskets carried first by the horsemen raised by Marshal Brissac, 1600. This gave these soldiers the name of dragoons; and from the general adoption of the same weapon, though without the emblem in question, the term gradually extended itself till it became almost synonymous with horse-soldier. Dragoons were origin-

## DRAGUIGNAN—DRAIN.

ally a kind of mounted infantry, drilled to perform the services both of horse and foot. At present, *dragoon* is one among many designations for calvary, not precise in its application.

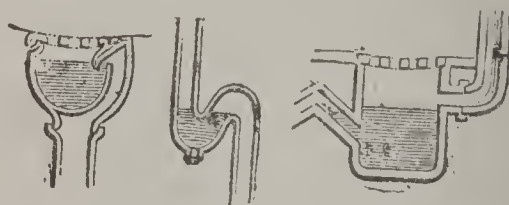
In the British army, the *heavy* dragoons and the *light* dragoons are carefully distinguished in regard to the weight of the men, horses, and appointments. The first dragoons in the army were the Scots Greys, established 1683. In the British army, there are at present 7 regts. of 'Dragoon Guards,' and 21 regts. of 'Dragoons,' besides the three cuirassed regts. of household troops: see HORSE GUARDS. In the U. S. milit. service the term is not in use.

DRAGUIGNAN, *drá-ghên-yǒng'*: town of France, dept. of Var, on a tributary of the Argens, about 40 m. n.e. of Toulon. It is charmingly situated, in a valley with the slopes of the surrounding hills covered with vineyards and olive plantations. It is moderately well built; and its streets are adorned with numerous fountains and trees. Its principal structures are the prison, the court-house, a hospital, and a stately clock-tower. It has manufactures of coarse woolens, leather, hosiery, silks, soap, brandy, oil, and earthenware. D. is an ancient place. During the middle ages it was strongly fortified. The fortifications were destroyed in the civil wars, but were reconstructed 1615. Pop.(1891) 9,816.

DRAIN, v. *drân* [AS. *drehnigean*, to strain: O.H.G. *drahan*, a drop, a tear: Gael. *druigh*, to soak or ooze through: prov. Sw. *dradda* to drop]: to make dry by drawing off the water gradually; to flow off gradually; to free from water gradually; to empty; to exhaust; to be freed from moisture. N. a channel, trench, or ditch for conveying water; a sink or small sewer; a gutter. DRAIN'ING, imp. DRAINED, pp. *drând*. DRAIN'ER, n. he who, or that which. DRAIN'ABLE, a. *-â-bl*, capable of being cleared of water or surplus moisture. DRAIN'AGE, n. *-âj*, the act of draining; that which flows out of a drain; the mode of carrying off the surface-water of a country, as by rivers, etc. DRAIN-TRAP, n. a device for allowing water to pass off without admitting the passage of air through the duct; also called *stench-trap*. DRAINING-AUGER, n. a horizontal auger occasionally used for boring through a bank to form a channel for water. It is also used for cutting an opening for laying lead-pipe or drain-pipe. In each case it is intended to save the labor of opening a trench. It is also used for draining marl-pits or cellars when the circumstances of the level suit. DRAINING-PLOW, n. a ditching-plow. DRAINING-PUMP, n. a pump (*pompe castraise*) for elevating water containing sand and gravel. DRAINING-TILES, n. tiles used in the draining of fields. DRAIN-WELL, n. a pit sunk through an impervious stratum of earth to reach a pervious stratum and form a means of drainage for surface-water.



Dragon Tree (*Dracæna Draco*) at Teneriffe.



Drain-traps shown in Section.



Dragon Tree.—Branch of *Cordyline* (*Dracæna*) *australis*.



## DRAINAGE.

**DRAINAGE**, in Agriculture: art of removing an excess of water from the land. Various processes, differing widely in cost and in the value of the results obtained, are in common use.

The simplest method, the one first devised and always adopted in newly settled countries, is the open ditch (see **DITCH**). Covered ditches, or underdrains as they are commonly called, are far superior and are largely used wherever agriculture has made much progress. The ancient Romans made many open trenches and constructed underground drains to some extent. In 1652, Captain Walter Blythe, of England, published a book in which he recommended the cutting of deep trenches and partially filling them with stones for the D. of bogs; but his method was not generally adopted. In 1763, an English farmer named Elkington discovered a way of draining certain soils by boring through the clay subsoil until the spring which caused the trouble was reached, and carrying off the water in open ditches. At the recommendation of the board of agriculture, parliament granted him £1,000 for the introduction of this system of improving lands. About 1836, William Smith developed a method applicable to all wet soils and thoroughly effective. He cut deep trenches which he partially filled with stones and then covered with earth, as had been previously recommended, and by making these drains parallel to each other secured their uniform and efficient action. In 1843, drain pipes, or tiles, were introduced, and a practical method of making continuous and permanent drains at a moderate expense was perfected. Three years later, parliament passed an act designed to assist landholders in draining their estates, and has since aided them in carrying out improvements in this line. In the United States, owing to the abundance of land and the low price for which it could be obtained, systematic D. was not attempted until a later period and has never become general.

D. of wet fields not only acts beneficially by carrying off the surface water in heavy rains, but is equally useful in permanently lowering the level at which water stands in the land. Thus it deepens the soil and allows the roots of plants to penetrate it farther and obtain stores of nourishment otherwise unavailable. It also cuts off the supplies, often very great, of water which rises from below, and which, having lost by filtration the fertilizing elements which it brought from the atmosphere, as well as much of its warmth, is far less beneficial to plants than water directly from the clouds. D. prolongs the season during which land can be cultivated. Planting can be done earlier and the season of growth is carried later into the autumn. On drained land, crops can be cultivated during wet periods between planting and harvesting, while on undrained soils they must, at such times, be left to shift for themselves. Another advantage is found in the increased warmth of drained land. Careful observation has shown that a thoroughly drained soil is 10 to 15 degrees warmer at a depth of seven inches than the adjacent undrained fields. D. also permits better tillage than would otherwise be possible. Thor

## DRAINAGE.

ough pulverization, which is absolutely indispensable to the rapid growth and fullest development of plants, cannot be effected in wet soil. By making the soil more porous, drainage largely increases its power of absorbing moisture from the air, and thus tends to prevent injury to crops from drought, as well as from a superabundance of water. By allowing the water to percolate through the soil, draining prevents the destruction of grain crops by 'winter-killing' and also the washing away of fertilizers which have been spread upon the surface. By admitting air and rain-water to the roots of plants it aids in the preparation of organic and inorganic matters for their food, and facilitates the passage of the essential elements of manures and fertilizers to a position in which they can be utilized. It benefits plants by insuring quicker germination of the seed, more vigorous growth, earlier maturity, and greater productiveness. The removal of stagnant water from a large area also causes important climatic changes and promotes the health of the inhabitants. This is seen in the decrease of fevers and kindred diseases where wet lands have been thoroughly drained. Various diseases of animals also are frequent on wet lands, which disappear when D. is effected; while insect pests, as flies and mosquitoes, are far more common in wet than in dry localities.

Lands resting upon a porous subsoil do not require artificial D., as the surplus water will readily pass below the point at which it would prove detrimental to plants. But where the subsoil is hard D. is required, and the land cannot be permanently and profitably improved while this is neglected. All lands which at any season of the year hold an excess of water are sure to be immediately and permanently benefited by drainage.

Of the different methods of D., besides the open ditch, furrow-draining, which consists in plowing the land in ridges upon which the planting is to be done and leaving large furrows for holding the water, was formerly employed, but has been generally discarded. For underdraining, which is far superior to open drains of any form, the mole plow has been used for opening a channel in clay soils, but will not work where there are stones or much variation in the character of the subsoil. No permanent benefit can be derived from its use. Plank drains, made by placing planks on edge at each side of a trench, laying a plank on top and covering with earth, last some years. Trenches partially filled with brush or turf are of no permanent value. Stone drains are far better than any of the preceding. A deep and wide trench, with very sloping sides, is partially filled with small stones over which large flat stones are laid. The remainder of the trench is then filled with earth thrown out when it was dug. On account of the much larger trench required and the labor of handling the stones this form of drain is more costly than tile, but is neither as durable nor as efficient. Tile drains are by far the best of any yet devised. Tiles are made of clay which is burned like brick and if properly laid will last for generations. They are made in various forms, of which the cylindrical is the most



## DRAINAGE-TUBES.

common as well as the best and most convenient. The joints are protected by collars, though some tiles are made with one end larger than the other, the small end of one being put into the large end of the next, so that a continuous pipe is formed. Water enters at the joints and, except where glazed tiles are used, through pores in the pipe.

The lowest point in the field should be chosen for an outlet. From this the main drain should be run up the slope. Lateral drains, running parallel with each other, should enter the main at right angles. The tiles must be laid at a regular grade, without regard to inequalities in the surface of the land. There should be a fall of at least four inches in every 100 ft., and twelve inches would be much better, though it is claimed that drains with a grade of less than two inches per hundred ft. have been successful. In large fields, or in those which slope in different directions, more than one system of mains and laterals may be required. The distance apart at which drains should be placed varies with the character of the land and the quantity of water. From 30 to 40 ft. will be proper for most soils. The depth of drains is an important point. In wet land, the level of the drain will also be the level of the stagnant water below which the roots of cultivated plants will not penetrate. Where drains are deeply laid the water is more perfectly filtered than it can be where they are shallow and the loss of valuable fertilizing matter is avoided. Four ft. may be considered a fair depth, though five ft. is decidedly better. The size of tiles required varies with the fall and the quantity of water to be removed. Probably mains from three to six inches and laterals from one and a half to two inches in diameter are most frequently used.

In all its details the work of D. should be performed in the best possible manner. The cost involved will depend upon the character of the land, the degree of fall, the methods adopted, and the materials employed. It is safe to say that no other line of farm improvement makes such prompt, liberal, and permanent returns for the expense incurred, and at the same time so largely increases the cash value of the property itself, as the thorough D. of wet and retentive soils.

DRAINAGE-TUBES, in Surgery: recent important addition to surgical appliances; introduced by a Fr. surgeon, Chassaignac. They are of india-rubber, from  $\frac{1}{8}$ th to  $\frac{3}{8}$ th inch in diameter, perforated with numerous holes, and of various lengths. They are useful especially in chronic abscesses (which it may be unadvisable to empty at once); in empyema (q.v.); and in withdrawing the fluid accumulation in certain classes of abdominal tumors; also in large wounds, such as those made by amputation, and in all cases where there is apt to be deep accumulation of discharge. They are introduced in such a manner that one end is on a level with, or projects above the skin; the other is in communication with the seat of discharge; and by allowing that discharge constantly to escape from the external wound, they diminish both chemical irritation from putrid accumulation and mechanical irritation from



## DRAINS—DRAKE.

pressure. Like all new inventions, this has its advocates<sup>s</sup> and opponents. Thus, while Sir William Paget, in his article 'Sinus and Fistula' in Holmes's *System of Surgery* says that '*drainage*, for which the perforated caoutchouc-tube of M. Chassaignac is a very happy invention, is applicable to a great number of cases; but chiefly to those in which a sinus or incomplete fistula depends mainly on pus collecting at a level below or distant from the aperture of discharge, or more generally, when pus is apt to be retained'—Sir William Paget's surgical colleague at St. Bartholomew's Hospital, in his article 'Abscess,' which immediately precedes that above quoted, objects to the drainage-tube on the grounds that, as a foreign body, it sets up irritation, and adds that 'if a proper opening be made, there can be rarely any occasion for a drainage-tube; and however carefully it is inserted, it must of necessity inconvenience and distress the patient.' Notwithstanding such objections, drainage-tubes are now generally used in surgical practice.

**DRAINS**, n. plu. *drānz* [perhaps older form of Eng. *grains*: Sw. *dragg*, distillers' grains, dregs: Rus. *drän*, refuse (see **DRAFF** and **DREGS**): in *prov. Eng.* and *OE.*, the spent refuse of malt in brewing.

**DRAKE**, n. *drāk* [Sw. *and-drake*, a male wild duck—from *and*, a wild duck; Ger. *enterick*, a male duck—from *ente*, a duck: Icel. *reckr*, a male: Gael. *dràc*, a drake]: the male of the duck kind; name of a fly.

**DRAKE**, n.: name given to the silver shilling of Elizabeth from the mint mark which was commonly believed to refer to Sir Francis Drake, but really was the armorial cognizance of Sir R. Martin, Master of the Mint in 1572.

**DRAKE**, *drāk*, Sir FRANCIS: abt. 1539–1595, Dec. 27; b. in a cottage on the banks of the Tavy, Devonshire, England. His father, who was a yeoman, and had 12 sons, was a zealous Protestant, and during the persecution under Queen Mary, fled from Devonshire into Kent, in which county his family was brought up. He obtained some kind of clerical appointment among the seafaring-men of the district, and in consequence, D.'s younger years were passed among sailors. D. was at an early age apprenticed to a neighbor of his father's, who possessed a bark, and occasionally made voyages to Zealand and France. When his master died, D. fell heir to the vessel, and carried on the old trade with considerable success. While coasting about, he heard of the exploits of Hawkins in the New World, and the recital took such a hold of his imagination, that, selling his ship, he proceeded to Plymouth, and joined Hawkins in his last expedition to the Spanish Main. The adventure was disastrous to all concerned, and D. came home much poorer than when he set out. Undismayed, however, he gathered around him wild and reckless spirits, and having raised sufficient money, they fitted out a vessel, and under the command of D. made several voyages to the W. Indies. In 1570, he obtained a commission from Queen Elizabeth, and cruised

## DRAKE.

in the W. Indies, enriching himself with plunder. In 1572, he sailed again for the Spanish Main, and, assisted by some other English ships, he plundered the town of Nombre de Dios. He then crossed the Isthmus of Darien, and beholding the Pacific, prayed God to grant him leave to sail an English ship in that sea. On Sunday 1573, Aug. 9, he came into Plymouth laden with spoil; and when the news spread of his arrival, the people forsook the service in church, and came out to gaze on the brave and successful sea-rover.

Under the sanction of Queen Elizabeth, D. again set sail, 1577. taking five vessels. He sailed to S. America, and plundered the coasts. In Sep. of that year he entered the Pacific. During his voyage, he was singularly successful. He sacked the Spanish towns on the coasts of Chili and Peru, and captured a royal galleon laden with plate. He then steered for the n. e., and sailed as far as 48° n. lat., in the neighborhood of the s. end of Vancouver's Island, hoping to find a passage back to the Atlantic; but the severity of the cold discouraged his crew, and he took shelter in Port San Francisco. He stayed there several weeks, and formally took possession of the country for the queen of England, naming it New Albion. He then steered across the Pacific for the Moluccas; reaching Ternate, he sailed for Java, thence he stretched across the Indian Ocean for the Cape of Good Hope, which he doubled in safety, and arrived at Plymouth 1579, Sep. 26, Sunday. He was graciously received at court. Elizabeth banqueted on board his vessel, and conferred on him the honor of knighthood.

During part of 1585 and the whole of 1586. D. was employed, with a fleet of 21 ships, against Philip II. of Spain, chiefly in the W. Indies and the coasts of S. America. In this, as in his former voyages, he plundered many towns, and enriched himself with spoil. During this voyage, he visited Virginia, which colony had been recently planted by Raleigh. Thence he returned home, and it is said brought tobacco with him.

Spain was now preparing an Armada for the invasion of England, and Elizabeth sent D. with a fleet of 30 sail to destroy the enemy's ships in their own harbors. He entered the Roads of Cadiz, passed the batteries 1587, Apr. 19, in the morning, and before night, destroyed 100 vessels, and possessed himself of immense booty. He then sailed along the coast burning and plundering. He entered the Tagus, and flouted the Marquis Santa Cruz, who was lying in that river with a large force of galleys. Having done all the mischief in his power to Spain, D., with that keen appetite for plunder which never forsook him, steered for the Azores, on the lookout for homeward-bound treasure-ships. He was fortunate enough to encounter a richly-laden carraek, of which he took possession. On his return, he spent a considerable portion of his prize-money in supplying the town of Plymouth with water.

D. was next employed as vice-admiral in the fleet under Lord Howard, which scattered the Armada, and broke the



## DRAKE.

naval supremacy of Spain. In 1589, he was sent to Portugal with a fleet, to expel the Spaniards, who had taken possession of that kingdom; but the expedition was unsuccessful. On his return, he was elected member of parliament for Plymouth. In 1595, with Sir John Hawkins, he was sent with a fleet to the W. Indies. In the course of the expedition, the commanders quarrelled. Hawkins died before reaching Puerto Rico. Attacking the place, D. received a repulse. Sailing away, he burned and plundered several towns. He came to anchor in Nombre de Dios, where a deadly disease broke out among the soldiers and sailors of the fleet. D. was at last smitten, and after struggling 20 days with the malady, he expired. On the day of his death, the fleet anchored at Puerto Bello, and there the bold sailor and buccaneer received his sea-funeral.

**DRAKE, FRIEDRICH:** 1805, June 23—1882, Apr. 6; b. Pyrmont: German sculptor. He was trained under Rauch of Berlin. Among his principal works are a *Madonna with her Infant* (purchased by the empress of Russia), a *Dying soldier* a *Vintager*, *The Eight Provinces of Prussia* (colossal allegorical figures, adorning a hall in the royal palace at Berlin), and a *Warrior crowned by Victory*, reckoned one of the master-pieces of Prussian sculpture. But D. owes his celebrity chiefly to statues, busts, and medallions. There are few great countrymen of his of whom he has not made a marble memorial. His statues of Schinkel, the two Humboldts, Rauch, Oken, his colossal statues of Frederick-William III., and William I. at Cologne, deserve especial mention; as also the busts of Bismarck and Moltke. He was long prof. of sculpture in the acad. at Berlin.

**DRAKE, JOSEPH RODMAN:** 1795, Aug. 7—1820, Sep. 21; b. New York: poet. He entered upon a mercantile career when a boy, began studying medicine when 18 years old, graduated when 20, and married a daughter of Henry Eckford, naval architect and ship-builder, when 21. He began writing verses before he was 14 years old, and when 17 became acquainted with Fitz-Greene Halleck, with whom he maintained the closest intimacy till his own death. He made a tour of Europe 1818, was associated with Halleck in anonymously contributing the 'Croaker' series of amusing verses to the *Evening Post* 1819, and spent the winter preceding his death in New Orleans seeking relief from consumption. His poems, of which nearly all were written before he was twenty-one years old and several before he was 16, include *The Mocking Bird* and *The Past and Present* (1809), *The Culprit Fay* (1816), *The American Flag*, to which Halleck added the four last lines (1819), and in the 'Croaker' series *On Presenting the Freedom of the City in a Gold Box to a Great General*, *The Secret Mine Sprung at a Late Supper*, *To Mr. Potter the Ventriloquist*, *Ode to Mr. Simpson, Manager and Purveyor of the Theatre*, *The Battery War*, *To John Minshull, Esq., Poet and Playwright*, *Abstract of the Surgeon-General's Report*, *Ode to Impudence*, *Ode to Fortune*, *Ode to Simon Dewitt, Esq., Surveyor-General*, and *To Croaker, Jr.*



## DRAKE—DRAM.

**DRAKE, SAMUEL GARDNER:** 1798, Oct. 11—1875, June 14; b. Pittsfield, N. H.: historian. He received a common-school education, was a teacher 1818–25, and established the first antiquarian book-store in the country in Boston 1828. While collecting and selling books relating to the early history of this country, he engaged also in compiling, editing, and publishing works of rare historical value. He became one of the founders of the New England Historic-Genealogical Soc. 1847, its pres. 1858, and the editor of its quarterly *Register*. His re-publications, compilations, and original contributions to American history include *Church's Entertaining History of King Philip's War* with notes (1825), *Indian Biography* (1832), *Book of the Indians* (1833), *Old Indian Chronicle* (1836), *Indian Captivities* (1839), *Account of the Family of Drake* (1845), *Review of Savage's Edition of Winthrop's Journal* (1854), *History and Antiquities of Boston* (1856), *Result of Searches among the British Archives* (1860), *Memoir of Sir Walter Raleigh* (1862), *Introduction and Notes to Mather's Indian War of 1675–6* (1862), *Early History of New England* (1864), *Hubbard's Indian Wars* (1865), *The Witchcraft Delusion in New England* (1866), *Annals of Witchcraft in the United States* (1869), and *History of the French and Indian War* (1870).—His son, **FRANCIS SAMUEL D.** (1828, Feb. 22—1885, Feb. 22) compiled a *Dictionary of American Biography* (Boston 1872), and published *Memorial of the Massachusetts Society of the Cincinnati* (1873), *Life of Gen. Henry Knox* (1873), *The Town of Roxbury* (1873), *Tea-Leaves* (1884), and *Indian History for Young Folks* (1885), and edited Schoolcraft's *History of the Indians*.—Another son, **SAMUEL ADAMS D.**, became a brig.gen. in the Union army during the civil war, and has published *Hints for Emigrants to Pike's Peak* (1860), *Old Landmarks of Boston* (1872), *Old Landmarks of Middlesex* (1873), *Nooks and Corners of the New England Coast* (1875), *Heart of the White Mountains* (1881), *New England Legends* (1883), *Our Great Benefactors* (1885), and *The Making of New England* (1886).

**DRAKENBERG**, *drá kén-bérch*: ridge of mountains in s. Africa, forming part of the boundary of Natal (q. v.).

**DRAKE UNIVERSITY:** institution of the Disciples, at Des Moines, Polk co., Iowa; founded 1881, chiefly by Francis Marion Drake, brig.gen. in the civil war, afterward a railroad-builder. The univ. has theological, normal, law, medical, and music schools: the number of the faculty, 1902, was 104; the number of students 1,820. It has a library of 30,000 vols. Its endowment is \$225,000; gifts 1891–2 amounted to \$100,000. A new science hall cost \$30,000. Pres. H. M. Bell.

**DRAM**, n. *drām* [from **DRACHM**, which see: comp. prov. F. *drame*, a pinch of snuff: Gael. *dramaig*, a mixture of meal and water or whisky in small quantity: It. *dramma*, a very small quantity of a thing]: a small quantity, particularly of a liquid or liquid mixture; one eighth part of an ounce apothecaries' weight; one sixteenth of an ounce avoirdupois; a small glass of spirits to be drunk at once.

## DRAMA.

**DRAMA**, n. *drām'ă* or *drā'ma* [L. and Gr. *drama*, an act or deed, a play, a drama—from Gr. *drăō*, I do, I perform: F. *drame*]: a composition or species of poem in which the action or narrative is represented—not related, and fitted for representation on the stage; a play. **DRAMATIC**, a. *dră-măt'ik*, or **DRAMAT'ICAL**, a. *-i-kăl*, relating to the drama. **DRAM'AT'ICALLY**, ad. *-lî*. **DRAMATIC CORPS**, *kôr*, the whole body of actors attached to a theatre. **DRAMATIS PERSONÆ**, *drām'-ă-tîs pēr-sō'nē* [L. *persōnæ*, persons or characters; *dramătis*, of the drama]: the actors in a drama or play represented on the stage. **DRAM'ATIST**, n. *-tîst*, a writer of plays. **DRAM'ATIZE**, v. *-tîz*, to adapt to, or fit for, the stage. **DRAM'ATIZING**, imp. **DRAM'ATIZED**, pp. *-tîz*. **DRAMATIZATION**, n. *dră-măt-i-ză'shŭn*, the act or art of dramatizing, or describing scenes dramatically; dramaturgy. **DRAM'ATUR'GY**, n. *-tēr'ŭ* [Gr. *ergon*, work]: the science and art of dramatic compositions and representations.—*Drama*, or dramatic poetry, in its most general signification, represents *actions*, which are not stately narratives, as in epic poetry, or which do not aim at the musical expression of mental emotions, by language, as in lyric poetry. The drama consists of an impersonal representation, by the dramatist, of an animated conversation of various individuals, from whose speech the movement of the story is to be gathered. Thus, it is contrasted, on the one hand, with dialogue, or the dull and changeless flow of discourse, and on the other, with every other species of poetry, whether epic or lyric. In simple dialogue, the minds of the speakers remain unchanged; in the drama, the movement of the thoughts is so lively, and the expectation of the issue so vivid, that this species of poetry surpasses every other in interest and in intensity. In epic poetry, persons are frequently introduced engaged in lively conversation, and this is sometimes the case even in lyric poetry, but the prevailing tone of the epopee is descriptive and indirect. A novel, or an epic poem, can be described as dramatic only when it abounds in animated conversations, or when direct action prevails over description. All dramatic poetry may be divided into *tragic* and *comic*. Tragic poetry has for its aim to interest the earnest mind, while comic poetry endeavors merely to produce amusement. Tragic poetry may be described as that which interests the mind in the highest degree possible, and comic poetry as that which engages it in the most complete lawlessness. In comedy, gloom, sadness, sobriety have no recognized existence; while in tragedy, gayety, joviality, riotous mirth are unknown.

While the drama, doubtless, arose from that natural love of imitation peculiar to man, and from the childlike liveliness with which a simple narrator loves to recount anything which he has heard or seen, yet the creation of dramatic composition was, nevertheless, a feat of singular boldness. This arises from the wide difference between the disjointed elements of occasional imitation and the perfect invention of the genuine drama. The Old Testament, no doubt, contains numerous instances of dramatic dialogue, as in the Book of Job; and of lyric poems placed in a dra-



matic connection, as Solomon's Song; but there is in Hebrew literature no instance of the existence of the drama properly so called. The Hindus have an early dramatic poetry, but, unfortunately, this poetry dates back only to a time when the intercourse between Greece and India was close and frequent. It is to Greece alone that we must look for the invention of the drama, and to Athens, in particular, for its perfection. But even here it was exhibited originally at only a few festivals of a single god, Dionysus. This indicates that the origin of the drama is to be sought in the enthusiasm attendant on the worship of Bacchus. The ancient Greek writers tell us, that the drama originated in a choral song; and Aristotle (*Poet.* 4), that it had its origin in the singers of the dithyramb. Supposing that it originated in the pantomimic dances, the dramatic art, like every other, was only slowly purified from extraneous mixtures. Even the origin of the word tragedy has been disputed, though the inventor of it, Arion (B.C. 580), the celebrated dithyrambic poet, is known. Tragedy (*tragōdia*, from *tragos*, a goat, and *ōdē*, a song) is said to have taken its rise from the fact of the old dramas being exhibited when a goat was sacrificed, or because a goat was the prize, or because the actors were clothed in goatskins. Comedy (*kōmōdia*, either from *kōmos*, a revel, or *kōmē*, a village), signifies, literally, either the *revellers' song* or the *village song*, from the practice of strolling-players publicly exhibiting their dramatic skill about the streets. Thespis (B.C. 536) introduced the regular dialogue into the choral representations, and joined to the dithyrambic songs a person who was the first actor. Phrynichus (B.C. 512) used this single actor of Thespis for the representation of female characters, though with him the lyric element predominated over the dramatic. No further improvement of any note was introduced into tragedy before the time of Æschylus.

Comedy arose about B.C. 580, with Susarion, who travelled about through Greece, ridiculing, from a small movable stage, the follies and vices of his time. Tragedy, from its first recognition, was deemed worthy, by reason of its superior gravity and staidness, to entertain the refined inhabitants of cities; while comedy, at the outset, from its riotous fun and jollity, was judged more in harmony with the rustic habits of the country people. In time, comedy made its way into the city, and Epicharmus (B.C. 485), besides modelling this form of dramatic wit, after its more successful rival, tragedy, likewise introduced a number of distinguished comedians to the notice of the Athenians. Phormes, Magnes, Crates, Cratinus, Eupolis, Pherecrates, and Aristophanes, are the highest names in connection with the old Greek comedy—the last mentioned far the greatest. Tragedy, both from its ideal character, and from the stately cothurnus and long masks in which the actors of it appeared, aimed at a representation of what was dignified, noble, and grand in human nature. Comedy, from its style of caricature, its low-heeled sock, and its grotesque masks, tried to degrade humanity below its natural level. Comedy, during the Greek period of its history, divides



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itself into three forms—viz., old comedy, middle comedy, and new comedy. The old comedy is the direct opposite of tragedy; its form is essentially sportive, and a seeming aimlessness reigns throughout it. It is, in the opinion of A. von Schlegel (*Lectures on Dramatic Literature*), the only genuine poetic species of comedy, while the other forms of it show a tendency to decline into prose and matter of fact. In the new comedy, the form is rather serious than otherwise, and it is regularly tied down to the accomplishment of a certain aim. This is what is understood by comedy at the present day. It is a mixture of tragedy and comedy proper, of earnestness and mirth. Only fragments of Menander and of Philemon, the genuinely witty poets of the new comedy, have come down to us. The middle comedy, which came in between the old and the new, arose after the termination of the Peloponnesian war. The new oligarchy strictly prohibited the introduction of living persons by name on the stage; and the chorus, till then the chief instrument of vituperation, is said to have been abolished.

With Æschylus, Greek tragedy properly begins. He himself instructed his actors in the rehearsal of his pieces. In his dramatic compositions he aimed more at sublimity than beauty, more at the heroic than the human. Sophocles perhaps, superior to Æschylus in his appreciation of human nature, strove more to depict idealized men than to paint heroic excellence. He introduced a third actor on the scene, and materially improved the mechanism of the stage. Euripides was too much of a nice speculator to attain the highest forms of poetic expression. Instead of quietly contemplating life as Sophocles did, he seems to have been morose and peevish; but in moral denunciation, no dramatist surpasses him. With these three great poets, Greek tragedy may be said to close. With them it ceased to be the tragedy which Aristotle has described in his celebrated definition of it, *Poetics*, 6: 'Tragedy is the imitation of some action that is serious, entire, and of a proper magnitude; effecting, through pity and terror, the refinement of these and similar affections of the soul.' In the hands of the subsequent authors this form of the drama grew lax and effeminate, and in the performances of Theodectes especially, tragedy was made to give way to rhetoric. (See the works of Böckh and Welcker on the Greek tragedians; also, Müller's *Literature of Ancient Greece*.)

The Romans were not a great dramatic people. They borrowed, according to the common account, during a period of national despondency occasioned by a desolating pestilence (A.U.C. 391), their first idea of a play from the Etrurians: their effusions of sportive humor, their *Fabule Atellanæ*, from the Oscans; and the higher class of dramatic compositions from the Greeks. Philology, likewise, countenances this story; for *histrion*, the Latin word for a player, is pure Etruscan. No remains of any note have come down to us of the comic writers of Rome, except Plautus and Terence. The former was a poor day-laborer, the latter a Carthaginian slave. The habits of each appear

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in their writings. Plautus has a degree of rough vigor and broad jocularly, born of the hand-mill and the plow, while Terence is more refined and delicate in his wit and characterizations. Both these writers borrowed largely from the Greeks. Of the early period of Roman tragedy no remains exist, but it is probable that its poets were merely translators or imitators of Greek models. The tragedians of the Augustan age were ambitious of rivalling the Greeks. Unfortunately, none of these grand attempts have come down to us, except ten bombastical and frigid dramas, that go under the name of Seneca.

Ancient art fell with pagan Rome. In the early ages of Christianity, no one connected with the theatre was allowed baptism. The unwise zeal of the fathers was followed by an edict of the Emperor Julian to the same effect. The two Apollinarii, father and son, and Gregory of Nazianzen, attempted to introduce religious plays or mysteries, drawn from the Scriptures, to amuse the Christian people during the operation of Julian's law. In a short while, instead of the drama proper, there was nothing to lighten up the surrounding darkness but such productions as the saturnalian pageants, the Feast of Fools and the Feast of the Ass.

The Italians are the people of Europe, who, first after the long sleep of the true dramatic spirit in the middle ages, strove to enkindle the ancient fire on Roman hearths that had for long years been cold. Early in the beginning of the 16th c., the first regular modern drama was published. It was called *Sophonisba*, and the writer was a very commonplace author, by name Trissino. Shortly afterward this tragedian was followed by Ariosto, by Babbiena, and by Macchiavelli, all distinguished cultivators of the classic comedy. Toward the end of the c., Giambattista de la Porta, philosopher and comic writer, exhibited a number of pieces of a familiar, sometimes even farcical kind, but full of happy invention and agreeable originality. The political influence of Spain was now at its height on Italian territory, and the romantic drama of the West gradually found favor in Italy. Even so early as 1539, Ricchi had attempted to overthrow the classic taste in Italy, but without success. It remained for Borghini, Oddi, and M. A. Buonarroti, nephew of the great artist, with one or two other writers, to break in upon the current taste, and to do much to introduce the romantic drama in Italy. In the 17th c., Rinuccini, by the union of music with the romantic drama, succeeded in establishing the *melodrama*. Tragedy and comedy were now entirely laid aside as antiquated, and nothing but the *musica opera* was heard of from Milan to Ravenna. Maffei led the way in reforming the Italian stage. The political preponderance of Spain had now given way to that of France, which facilitated his labors not a little. His *Merope* is a fine attempt to restore the tragic drama to Italy, but as Lessing says of it, in his *Dramaturgie*, it is rather the production of a 'learned antiquary' than of a great tragic poet. The musical drama had to be rendered classic,

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and this task was undertaken by Zeno and Metastasio. The latter, who has all the attractiveness for the Italians that the classic Racine has for the French, by subtle harmony and grace in his songs, by his power of painting pathetic situations, and by his melting effeminacy of manner, charmed the hot southerners as no other poet yet had done. After Goldoni, a great comic authority in Italy, and a careful student of Macchiavelli and Molière—except Riccoboni and Gozzi his rivals—we have few dramatists of any note till the last century. The bold and passionate Alfieri inaugurated a new era in Italian tragedy. He is a follower of the classic school, and a strict observer of the Aristotelic unities. His successors have relaxed more their adherence to classic forms, and have produced some admirable dramas. Among the most estimable of those writers are Monti, Manzoni, and Niccolini.

In the other European nations as soon as dramatic composition rose to any degree of purity, it became thereby disconnected with the church. But in Spain this is not the case, for their best poets, while writing for the stage, have busied their pens in the composition of religious dramas. Passing over the names of Villena, Santillana, Naharro, and Rueda, as diligent but comparatively weak builders of the fame of the Spanish drama, we come to the periods of Cervantes, of Lope de Vega, and of Calderon, when the Spanish stage may be regarded as in its best condition. In his *Numantia* particularly, Cervantes, whose genius was more decidedly epic than dramatic, has left to the world a specimen of tragic invention and of moral dignity which it is not likely to forget. While the critics were clamoring about the classic rules and the Aristotelic unities, Lope de Vega appeared on the scene, to set nearly all the dramatic laws at defiance. He is the most fertile dramatic writer in the world, besides being one of the best. Yet he prostituted his pen to serve the public, and sacrificed his future fame to his living popularity. Calderon, who succeeded him, possessed all his chief advantages, with the important additional merit of being thoroughly devoted to dramatic art as to a mistress. So great was Calderon reckoned in the composition of religious plays, that by letters-patent he enjoyed a monopoly of these productions for 37 years. The brilliant period of the Spanish theatre, comprising the first half of the 17th c., had with the death of Calderon nearly closed. Except Moreto, Tirso de Molina, and Solis the historian, there is no writer of any note to engage the attention.

In France, the unities, as they are called, have been observed with as much strictness as if the country had been an old Grecian province. This is owing chiefly to the influence of the criticisms of Boileau, who adopted the dramatic unities in all their severe rigor. The critics of other nations, particularly of Germany and of England, have chosen to condemn this exposition of the drama, and sometimes to despise even the Stagirite as a dramatic critic. The dramatic unities are threefold—Action, Place, and Time. According to the French, these unities have the following



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significance: 1. That the action of the drama must be one—that is, that the interest or attention must not be distracted by several plots, but everything must be subservient to the main action; 2. That all the actions must take place on the same spot, or very nearly so, in order that the illusion may not be disturbed; and 3. That everything should happen on the same day, for the same reason. Much has been written for and against these rules. Suffice it to say, that these are the landmarks on which the classic dramatist fixes his eye. Previous to Jodelle, or indeed to Corneille, hardly any progress had been made in the regular drama in France. A number of writers, of more or less ability, had produced *mystères*, *soeties*, *moralités*, *farces*, in which, in numerous instances, the romantic or anti-classical tendencies of human nature had manifested themselves; but neither in the case of the Brethren of the Passion, nor in the case of the *Enfants sans Soucis*, was there any progress made in the proper business of dramatic composition. Jodelle was the first writer who composed a regular five-act tragedy, and he publicly exhibited it in the presence of the court of Henry II. of France. He composed other pieces of equal, some of superior, merit, but nothing of any importance in the drama appeared before the time of Corneille. This writer, who appeared in the reign of Louis XIV., during the time that the star of Richelieu was in the ascendant, had to humor the court by humoring the academy; and to please the academy he was required to observe the rules of Aristotle. He produced seven plays, as cold and as severe as if they had been written by Sophocles, but of great elegance and dignity of style, when it seems to have struck him that he might give more free scope to his romantic tendencies in the tragedy of the *Cid*. All Paris rang with its praises, but the academy gloomed, and poor Corneille had to betake himself again to the dignity and severity of the Greek drama. He got what he longed for, however—a seat among the members of that institution which has been so instrumental in repressing the spontaneous outflow of his genius. It was more than his successor, Molière, obtained, who insisted to the last on playing his part as well as penning his pieces—an abuse which the dignified academicians could by no means tolerate. The genius of this dramatist was decidedly comic, and it may be questioned, whether, in all the essentials of true comedy, Molière's is not the very foremost name in the history of the stage. He borrowed much from the Spaniards, though perhaps less than Corneille; a great deal from the Latins; and more perhaps from the Italians. But the favorite tragic poet of the court of Louis XIV. was Racine. His genius lay decidedly toward the serious and the exalted, so that he had no temptations, like Corneille, to trespass the bounds of the academic proprieties. In tenderness and elegance, all French writers give way before him. In his *Athalie*, his last and best drama, he gave to the Parisian public a composition, such as in breadth, in elegance, and in severe grandeur, it could find nowhere out of the Greek theatre. But we must push through the crowd of lesser lights which shone on the

decline of Racine and Molière, and glance at that bright and fitful luminary—Voltaire. He pressed boldly forward, and astonished all Europe with the force and power of his romantic dramas, a style of composition which, since the *Cid* of Corneille, had been excluded from the theatre. His spirit of intolerance was perhaps felt in his dramas, and his increasing warfare with superstition and fanaticism was too distinctly experienced even in the theatre. But his genius and spirit have earned for him a place beside Corneille and Racine as one of the tragic names which France delights to remember. Boursault, Regnard, Légrand, Lemer cier, Victor Hugo, Dumas, and Alfred de Vigny, would all require to be noticed in a full view of the French drama.

The German drama is dependent for its fame, almost wholly on the names of Lessing, Goethe, and Schiller. For while Frischlin, Rebhun, Hans Sachs, and Ay rer were original, and some of them fertile; while Gryphius, Gottsched, Gellert, and Schlegel show a decided advance in the appreciation of the laws of dramatic composition; yet from the feebleness of the writers, and from the backward state of theatrical taste in the end of the 17th and the beginning of the 18th c., very little was done toward a clear recognition of the excellence of dramatic literature, till the critic Lessing, in his *Miss Sara Sampson*, taught Germany to appreciate the productions of the romantic drama. As a critic, he blamed the French, praised Shakspeare, and professed belief in Aristotle. He held more than one dramatic heresy, and his antipathy to versification was among the number. Goethe is, without doubt, one of the greatest geniuses which the world has seen, but whether he is entitled to so high a place for his theatrical dramas remains an open question. As his aim was more emphatically the culture of his genius in its fullest form, the circumstance of his writings assuming the dramatic form is rather an accident than otherwise. From first to last he seems to have been distinctly aware of this, and in the prologue to his last, and by far his grandest production, he declares why he could not accommodate his genius to the demands of a mixed theatre. Yet his *Faust* must ever be regarded as one of the grandest and most remarkable compositions which modern Europe has witnessed. Schiller was more expressly the dramatic poet of Germany than Goethe. While Goethe's genius was fuller and more complete, Schiller made up for what he wanted in breadth of vision by the moral intensity of his genius. From his wild play of the *Robbers*, down to his last drama of *Wilhelm Tell*, he worked with a vehemence such as has seldom been witnessed. But he filled Germany, and indeed all Europe, with his tragic fame, and his name is one which 'posterity will not willingly let die.'

Dramatic exhibitions in England, perhaps originated in the church, but if not, they were speedily appropriated by the clergy. Ecclesiastics were frequently the composers of the religious pieces, or mysteries, and they were not seldom the actors. The mass of the people, no doubt, owed a good deal of grotesque amusement, and even of occasional information, to the biblical and legendary history, which those



rude attempts at the drama were fitted to convey. Those old religious plays are generally divided into two classes—*miracles* or miracle-plays, and *moralities* or morals. The former were founded on Scriptural narratives, or on the legends of the saints; the latter arose from the former, by the increased introduction of imaginary features. These pious pastimes existed long before the Reformation, and were not overthrown by that great revolution in the opinions and beliefs of the country. See MYSTERIES AND MIRACLE PLAYS. It was about the middle of the 16th c. that the drama extricated itself completely from these ancient fetters. By this time both comedy and tragedy had begun to exist in a rude reality in England. The oldest known comedy (before 1557), that of *Ralph Roister Doister*, was written by Nicholas Udall, a schoolmaster of considerable learning, probably about the middle of the 16th century. Ten years later appeared the first English tragedy, known as *Gorboduc*, or as *Ferrex and Porrex*, by Sackville (q.v., afterward Earl of Dorset) and Norton. Not only is this work the earliest tragedy in our language; it contains, beside, the first application of blank verse to dramatic composition. But the play is dull, heavy, and declamatory. The drama lingered in this incipient condition until very near the time of Shakspeare. Bishop Still's *Gammer Gurton's Needle* is no improvement on *Roister Doister*. The names of Kyd, Lodge, Greene, Lyly, Peele, Marlowe, Nash, etc., must pass almost without comment. Many of these writers are not without their merits, particularly Marlowe, whose plays of *Edward II.* and of *Dr. Faustus* are acknowledged by Charles Lamb to contain passages that Shakspeare himself has not surpassed. Marlowe, besides, is the first author who introduced blank verse upon the *public* stage. But all these dramatists are obscured by their nearness to the great luminary of the English drama. Shakspeare is now universally acknowledged to be the greatest dramatic genius that has ever appeared in the world. He brought the romantic drama to a perfection which it is not likely to surpass. His writings present the finest example of the depth, sublimity, refinement, and variety of which the drama is capable; and they are abundantly marked by those peculiar characteristics which sprang from the union, in the person of its author, of such wonderful powers of conception with such familiar experience of theatrical management. Of course he despised the unities, or rather, we might say, he worked in ignorance of them, for he knew nothing of Aristotle; and Boileau and the rest of the French critics were not born when he died. Hence his drama is known in literature as 'irregular'; and, we fear, human nature likewise is very irregular. The poet trusted to his own instinctive judgment, of whose exercise there are fortunately plenty of examples. The principal of Shakspeare's contemporaries are Ben Jonson, and Beaumont and Fletcher. Like Shakspeare, Jonson wrote both tragedies and comedies. Milton speaks of 'Jonson's learned sock,' and thus hits off the main feature of his character as a dramatist in a phrase. Beaumont and Fletcher, who were, like many brotherly



men in that age, joint-workers, have the honor of standing next to Shakspeare in the romantic drama of England. But, like Lope de Vega, they wrote too much for the mere success of the moment to be ranked in the foremost file of England's dramatic writers. With Massinger, Ford, and Shirley, the old English drama is closed. Dryden, the literary chief of his age, who flourished during the latter half of the 17th c., wrote some fine pieces of Frenchified declamation. Lee, and the unfortunate Otway, bring down the drama to the beginning of the 18th century. For, while Gay, Congreve, Cibber, Wycherley, Vanbrugh, and Farquhar, all show considerable dramatic spirit and invention, their works are, nevertheless, morally considered, the foulest things in the language. They paint well the externals of society, and have left good specimens of the 'comedy of manners,' as it has been called; but vice is both warp and woof of nearly everything that they have produced. Addison, Johnson, Young, Thomson, etc., wrote some good poetry, but poor dramatic verse; while Lillo, Moore, Garrick the actor, Goldsmith, the Colmans, and Cumberland, nearly all took to prose instead of verse for their agreeable comedies. Sheridan gave an unprecedented and unique impulse to 'genteel comedy.' Holcroft, Mrs. Inchbald, 'Monk' Lewis, and Maturin left a legacy of terror and wonder. Joanna Baillie and Sheridan Knowles remind the reader of the excellences of the old English drama, and the *Lady of Lyons* of Bulwer Lytton is still a favorite. Byron, Shelley, Coleridge, Sir Henry Taylor, wrote fine dramas; Swinburne has given us admirable dramas, more suitable for the library than for the stage; and plays by Browning and Lord Tennyson have been acted. Other recent writers are Talfourd, Jerrold, Shirley Brooks, Marston, Tom Taylor, Charles Reade, Robertson, Wills, H. J. Byron, Pinero, Sims, and Gilbert. For the great actors, see the articles on Garrick, Kemble, Kean, Macready, Mathews, Siddons, etc. Of late the drama in England has been much promoted by the acting of Henry Irving.—See Archer's *English Dramatists of To day* (1832), and *About the Theatre* (1833); Klein, *Geschichte des Dramas* (12 vols. 1876); Ward, *History of English Dramatic Literature* (1875); Payne Collier, *History of Dramatic Poetry*; Fitzgerald, *New History of the English Stage* (1882); and J. A. Symond's *Shakspeare's Predecessors in the English Drama* (1884).

DRAMA IN THE UNITED STATES.—This country has not been prolific in dramatic authors, and the list of those who have produced works that have lived is very small. Dramatizations and adaptations have of late been found more profitable than authorship, and the modern system of star-acting has subordinated author, adapter, and actor alike to the one chief performer. Hence, many of the pieces that have attained popularity in recent years are known almost wholly by the name of the star actor or actress. A few years ago people went to the theatre to see Brown's *Deluge*, now they generally go to hear Smith in the *Deluge*. And so, with few exceptions, the author or adapter has come to be considered a minor personage. Small, therefore, as is the list of purely

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American dramatists, it contains a number of names of more than national fame. Robert M. Bird (1803-54) wrote three tragedies, *The Gladiator*, in which Edwin Forrest achieved one of his most pronounced successes, *Oraloosa*, and *The Broker of Bogota*. George H. Boker, of Philadelphia (b. 1823), amid his public and other literary duties, has produced the tragedies *Calaynos* (1848), *Anne Boleyn* (1850), *Leonor de Guzman*, and *Francesca da Rimini*, and among other plays *The Betrothal* and *The Widow's Marriage*. David Paul Brown, lawyer (1795-1872), wrote (and the elder Booth appeared in the title-rôle) the tragedy of *Sertorius, or the Roman Patriot* (1830), another tragedy, *The Trial*, a melodrama, *The Prophet of St. Paul's*, and a farce, *Love and Honor*. Bartley Campbell (1843-88), the most prolific of American dramatists, whose extreme application resulted in insanity and death, was author of *Through Fire* (1871), *Peril* (1872), *Fate, Risks, The Virginian*, *Gran Vale* (1874), *On the Rhine* (1875), *Heroine in Rags*, *How Women Love* (title changed to *The Vigilantes*), *Clio* (1877), *Fairfax, or Life in the Sunny South* (1878), *My Partner* (1879), *The Galley Slave* (1879), *Matrimony* (1879-80), *The White Slave*, *My Geraldine*, *Siberia*, *Paquita*. Robert T. Conrad, lawyer (1810-58), wrote the tragedy *Aylmere*, which Edwin Forrest bought and played in for many years. He took the part of *Jack Cade*, and the fame of the actor in that character gradually led the play to be better known by the principal part than its title. Conrad wrote also a tragedy, *The Heretic*, which it is believed was never put on the stage. Augustin Daly (b. 1838), besides adapting many French and German works, has written *Divorce*, *Pique*, *Horizon*, and *Under the Gaslight*. Anna E. Dickinson (b. 1852), noted as a platform lecturer, wrote *A Crown of Thorns* and appeared in the principal rôle 1876, and two years afterward wrote *Aurelian* for John McCullough. William Dunlap, artist (1766-1839), wrote two tragedies which met considerable favor, *The Father* (1789) and *André* (1798). Abraham Oakey Hall, ex-mayor of New York (b. 1826), wrote the prologue to the rollicking pantomime *Humpty Dumpty*, and a play entitled *The Crucible*, in which he appeared as *Wilmot Kierton* 1875, Dec. Bronson Howard (b. 1841), who might with truth be called the father of the society-play in America, has written *Saratoga* (1870), *Diamonds* (1872), *Hurricane* (1878), *The Banker's Daughter* (1878), *Wives* (1879), *Young Mrs. Winthrop* (1882), *One of Our Girls* (1885), and *Met by Chance* (1887). Julia Ward Howe (b. 1819) has contributed to dramatic literature *The World's Own*, played at Wallack's Theatre, 1855, Nov., and written a tragedy, *Hippolytus*, for Edwin Booth, which has never been published nor acted. Joseph Stevens Jones (1811-77) was credited with the authorship of over 200 plays, among which the best known are *The Silver Spoon* (in which the late William Warren made one of his earliest successes as *Jefferson Scattering Batkins*), *Solon Shingle*, *Eugene Aram*, *Siege of Boston*, *Moll Pitcher*, *The Carpenter of Rouen*, *The Surgeon of Paris*, *The Last Dollar*, *Paul Revere*, and *Captain Lascar*. Anna Cora Mowatt (1819-70) was an actress of high merit, a writer of



## DRAMMEN—DRAPE.

pleasing fiction, and author of three plays, *Gulzara, the Persian Slave* (1840); *Fashion, a Comedy*; and *Armand, or the Peer and the Peasant* (1847). James Kirke Paulding, friend and collaborator with Washington Irving (1779-1860), published a vol. of comedies in connection with his son, Washington Irving Paulding, of which *The Bucktails, or the Americans in England* he acknowledged as his own work. John Howard Payne (1792-1852) was author of a large number of dramas. It was in his *Clari, or the Maid of Milan*, that he introduced his never-dying song, *Home, Sweet Home*. His *Brutus*, a tragedy, was produced 1818 with Edmund Kean in the principal part, and his *Charles the Second* was a favorite with Charles Kemble. Epes Sargent (1812-80) wrote a 5-act play, *The Bride of Genoa*, for Josephine Clifton, and a tragedy, *Velasco*, for Ellen Tree. Harriet Beecher Stowe (b. 1813), with no intention of producing a work for dramatic presentation, invested *Uncle Tom's Cabin* with such a wealth and completeness of dramatic requisites that the book fell almost naturally into the lines and situations of stage action, and proved one of the most thrilling and effective dramas the world has ever witnessed. Nathaniel Parker Willis (1807-67) wrote two dramas, *Tortosa, the Usurer* and *Bianca Visconti*, and Samuel Woodworth (1785-1842) produced several dramas, but the fame of his song *The Old Oaken Bucket* has eclipsed that of all his other writings.

**DRAMMEN**, *drám'mèn*: seaport town of Norway, province of Aggerhuus, on both sides of the river D., which here discharges its waters through the D. fiord into the Gulf of Christiania, about 24 m. s.w. of Christiania. D., which is built in a valley, is divided into three quarters—Bragenæs on the n. bank of the river, and Stromsøe and Tangen on the s., united to the first by a handsome bridge. The chief streets, which run along each side of the river, are mainly of houses. The manufactures of D. are leather, ropes, sailcloth, tobacco, spirits, and earthenware; but the chief industry is the export of timber. Pop. (1891) 20,684.

**DRANK**, v.: see **DRINK**.

**DRAPE**, v. *drāp* [F. *drap*, cloth; *draper*, to make cloth, to cover—from mid L. *drappum*: Sp. *trapo*, tatters, cloth]. to cover with folds of cloth or drapery for use or ornament. **DRA'PING**, imp. **DRAPED**, pp. *drāpt*: **ADJ.** having on drapery; clothed. **DRAPER**, n. *drā'pēr*, one who sells cloths: in England, dealers in woolen cloths for garments. **DRAPER'S COMPANY**, in London, one of the wealthy civic corporations, with a hall and almshouses. **DRA'PERY**, n. *pēr-ī* [F. *draperie*]: hangings; curtains. cloth goods. *Drapery, in Art*, is the representation of folds of cloth, clothing, or dresses in paintings or sculptures. From the very great difficulties with which the artist has to struggle in dealing with the arbitrary and ungraceful forms of modern dress (see **COSTUME**), we are often led to regard drapery as an impediment, in place of an aid and accessory, to the representation of the human form in plastic art. The error of this conception is manifest at once to those who



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direct their attention to the study of drapery in antique art, with a view to discovering not so much how as why it was employed by a people whose national customs admitted of their almost wholly dispensing with it had they felt so disposed. Such a study brings into view the fact that, when properly disposed, drapery tends, in many cases, to exhibit the form, to enhance the characteristics, and to intensify the attitude, whether in action or in repose. Drapery tells, moreover, something of the circumstances in which the action takes place beyond what could possibly be told by the naked figure. The waving or streaming drapery of a hunting Diana, or an Apollo shooting with the bow, tells us at once that the action is taking place in the open air, with the fresh breezes of the Ægean blowing around them. On the other hand, that repose which is the peculiar characteristic of sovereignty, is indicated by the still and heavy character of the drapery which surrounds a Jupiter on Olympus, or a Cæsar on his throne. The simple rule for the disposal of drapery, seems to be that it shall never be employed without an object; and that every fold shall be a result, either of the form of the figure, of the circumstances in which it is placed, or of some previous fold to which the latter is subordinated.

DRAPER, *drā'pér*, HENRY, M.D., LL.D.: 1837, Mar. 7—1882, Nov. 20; b. Prince Edward co., Va.: scientist. He was educated at the Univ. of New York and graduated in the medical dept. 1858. After serving nearly two years on the medical staff of Bellevue Hospital, he was elected prof. of physiology in the Univ. of New York 1860, and of physiology and analytical chemistry in the scientific dept. 1866, and subsequently dean. From the year of his graduation till his death he applied the greater part of his time to photographic and spectroscopic examinations of the moon and other heavenly bodies, and in this occupation achieved world-wide renown. Shortly after graduating he went to Ireland, made a thorough study of the Lord Rosse telescope, and on his return erected an observatory on his estate at Hastings-on-the-Hudson, and constructed with his own hands the largest telescope then in the United States. As soon as this was ready for use, he similarly constructed a photographic instrument, and then applied all his leisure to celestial photography. His earliest success was a distinct negative of the fixed lines in stellar spectra, and his most noted photograph was that of the surface of the moon, which excited the deepest interest of the scientific world. He obtained excellent negatives of the spectrum of  $\alpha$  Lyræ 1872, and of the diffraction spectrum 1873, resigned his professorship to secure more time for his researches 1873, superintended the photographic equipment of the U. S. commission for observing the transit of Venus, and received from congress a gold medal for his services 1874, and surprised the scientific world by the publication of *The Discovery of Oxygen in the Sun by Photography, and a New Theory of the Solar Spectrum*, 1877, July. He photographed the corona at the solar eclipse, at Rawlins, Wyo., 1878, July 29, and subsequently the nebula of Orion and the spectrum

## DRAPER—DRAUGHT.

of Jupiter. Prof. D. was a member of the National Acad<sup>y</sup>. of Sciences, and of numerous scientific societies in the United States and in Europe; was author of *On the Construction of a Silvered-Glass Telescope* (pub. by Smithsonian Institution 1865), *A Text-Book on Chemistry* (1866), and numerous papers in the *American Journal of Science*; and received the degree LL.D. from the Univ. of New York and the Univ. of Wis. 1882.

DRAPER, JOHN WILLIAM, M.D.: 1811, May 5—1882, Jan.; b. near Liverpool, England: chemist and physiologist. He was educated at a Wesleyan school at Woodhouse Grove, and later pursued his studies in chemistry under Dr. Turner of the London University. In 1833, he joined some of his relations who had emigrated to America, and 1836, took his degree M.D. in the Univ. of Pennsylvania, and was appointed prof. of natural philosophy, chemistry, and physiology, in Hampden-Sidney College, Va. In 1839, removing to New York, he was connected with the preparatory department of a medical school, and in 1841 joined Doctors Mott, Patterson, etc., in founding the Medical College of New York Univ., in which he was at first prof. of chemistry, and from 1850 of physiology. He was a clear and able lecturer, and a voluminous writer, having been a liberal contributor to the *American Journal of Medical Science* and the *Edinburgh Philosophical Journal*. Among his works are *The Forces which produce Organization in Plants* (1844); *Text-book of Chemistry* (1846); *Text-book of Natural Philosophy* (1847); *Human Physiology, Statical and Dynamical or the Conditions and Course of Life in Man* (1856); *History of the Intellectual Development of Europe* (1862); *Thoughts on the Future Policy of America* (1865); *Philosophical History of the Civil War in America* (1867–70); *History of the Conflict between Religion and Science* (1874).

DRAPIER LETTERS: see SWIFT, JOHNATHAN.

DRASTIC, a. *drās'tik* [Gr. *drastikos*, active, vigorous—from *drāō*, I do, or act: F. *drastique*]: powerful; acting rapidly and violently: N. a strong purgative medicine. DRAS'TICS, n. plu. *-tiks*, powerful purgatives.

DRAUGHT, n. *drāft* [from *drag* or *draw*, which see: Dut. *dragt*, a load, a burden: Icel. *draga*, to draw]: that which is dragged or drawn; the act of drawing, or quality of being drawn; force necessary to draw (as applied to plows, wagons, etc., see TRACTION): act of drinking, or the quantity drunk at once; the number of fish caught at one drag of the net; a detachment or number drawn away, as men from an army; the depth to which a ship sinks in water when afloat; a current of air; a delineation or representation of a thing by lines; in *Scrip.*, a sink; a privy—see Matt. xv. 17: V. to draw out; to detach from the main body. DRAUGHTY, a. *drāft'ti*, exposed to fitful currents of air. DRAUGHT-BAR, or DRAFT-BAR, n. a swingle-tree, double or single; bar of a railway-carriage with which the coupling is immediately connected. DRAUGHT-BOX, or DRAFT-BOX, n. an air-tight tube invented by Parker, by which the water from an elevated wheel is conducted to the

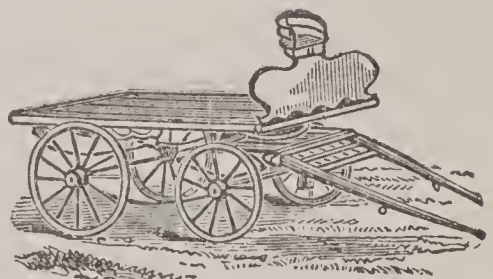




Drawbridge, Château of Montargis, France.



Drawbridge.



English Dray



Drip-stone, Westminster Abbey.



Drip-stone Terminations: 1, St. Cross, Winchester; 2, Chaddesley Corbett, Worcestershire.



## DRAUGHT OF WATER—DRAUGHTS.

tail-race. It is a means of rendering the whole fall available without placing the wheel at the bottom. **DRAUGHT-COMASSES**, n. compasses with movable points, used for drawing the finer lines in mechanical drawings, plans, etc. **DRAUGHT-EQUALIZER**, or **DRAFT**-, n. a treble tree; a mode of arranging the whiffletrees when three horses are pulling abreast, so that they may all exert equal force. **DRAUGHT-FURNACE**, or **DRAFT**-, n. a reverberatory air-furnace; one in which a blast is employed. **DRAUGHT-HORSE**, a horse that draws loads, opposed to a *saddle-horse*. **DRAUGHT-HOOKS**, hooks on each side of a cannon-carriage. **DRAUGHTSMAN**, n. *dräfts'män*, one who draws plans or designs, differing from a designer as he does not originate, but only reproduces, develops, or fills out the plan supplied him: see **DRAFT**. **DRAUGHT-ROD**, or **DRAFT**-, n. a rod extending beneath the beam of a plow, from the clevis to the sheth and taking the strain off the beam. **DRAUGHT-SPRING**, or **DRAFT**-, n. a spring intervening between the tug or trace of a draught animal and the load, whereby a jerking strain upon the animal is avoided.

**DRAUGHT** (or **DRAFT**) **OF WATER**, in Maritime Affairs: depth to which a ship sinks in the water when fairly float. The D. is marked on the stem or stern-post, or on both, from the keel upward. When a ship is in good trim, the D. does not differ much at the two ends. Ships with sharp bottoms draw more water, or have a 'greater draught,' than those of flatter construction.

**DRAUGHTS**, or **CHECKERS**: game played with 'men' on a checkered board, like a chess-board. As far as the *science* of the game is concerned, it falls far short of chess, but nevertheless requires considerable thought and skill. In France, it is called *Les Dames*, from having been favorite with ladies; and in Scotland, the draught-board is called the *Dambrod*. In the U. S. the name *Checkers* is most usual. The representation of the draught-board, numbered for illustration, will be found below.

Two persons usually play this game, each having a set of 12 men—one set black, the other white. The men may be placed either on the black or white squares, but the whole must be placed on one color only. Thus, in England, it is usual to play upon the white squares, with a black square at the lower right; and in Scotland upon the black, with a white square at the lower right. In the U. S. also, the men are usually on the black squares. In chess the men have different powers and moves; but in D. all are equal, except that some may, in play, become advanced to 'kings.' In chess, men may be moved straight forward, sidewise, or diagonally, and over many squares at once; but in D., the men may be moved diagonally only, and by *one* square at a time, unless when capturing an adverse man which is done by a jump over the captive. If an enemy's man stand in the way, no move can take place unless there be a vacant square beyond into which the piece can be lifted. The man leaped over is then taken and removed from the board. The grand object of the game is, therefore, to clear the

## DRAVE—DRAVIDIANS.

board of the enemy's men, or to hem them in so that they cannot be moved, and whichever party does so first, wins the game. As no man can move more than one step diagonally at a time, there can be no taking till the antagonists come to close quarters; and the advancing of them cautiously into each other's neighborhood is the chief art of the game. When a man on either side has made his way either by taking or by a clear open path, to the opposite side of the board, he is entitled to be 'crowned,'

	1		2		3		4
5		6		7		8	
	9		10		11		12
13		14		15		16	
	17		18		19		20
21		22		23		24	
	25		26		27		28
29		30		31		32	

which is done by placing another man on the top of him. Crowned men or kings may move either forward or backward, but always diagonally and by one square at a time, as before; and this additional power thus gained gives a great advantage to the player who gets the greatest number of kings, and usually decides the game in his favor.

**DRAVE**, *drāv* or *drāv* (Ger. *Drau*): river of Austria, rising in the e. of Tyrol, lat. 46° 45' n. and long. 12° 25' e. It flows n.e. through the Pusterthal toward Lienz, where it is joined by the Isel; then flows e. through Carinthia, passes Villach, where it becomes navigable, after which it passes Marburg, receives the Dran from the right, and the Mur, its principal affluent, from the left; then turning s.e., it forms the boundary between Croatia and Slavonia on the right, and Hungary on the left, and pours its waters into those of the Danube, ten m. e. of Essek, cap. of Slavonia. The D. is nearly 450 m. long. In the first part of its course, it is a mountain torrent, rushing furiously through the mountain passes of Tyrol; but joined by numerous streams, its volume increases, and its course becomes more staid.

**DRAVIDIANS**, *dra-vīd'ī-anz*: a large group of the non-Aryan races of s. India, including those speaking Tamil, Telugu, Canarese, and Malayalim; and sometimes subdivided into Dravidian and Kolarian. See **TAMIL: INDIA**.



## DRAW.

**DRAW**, v. *draw* [AS. *dragan*; Icel. *draga*, to drag or draw: Dut. *trecken*, to draw, as a sword, to trace outlines: L. *trahĕrĕ*, to draw]: to cause to move toward by pulling; to haul; to raise, as water from a well; to pull along; to pull out or unsheathe; to attract; to suck or inhale; to take or let out a liquid; to sketch or delineate; to describe; to allure or entice; to write in due form, as a bill of exchange; to have, receive, or take, as money; to protract or lengthen; to pull or exert strength in drawing; to move, advance, or approach; to require a certain depth of water, as a ship; to take the entrails, etc., out of, as a fowl. **DRAW'ING**, imp. **DREW**, pt. *dró*. **DRAWN**, pp. *drawn*: **ADJ.** one in which neither side wins, said of a battle or game. **DRAWABLE**, a. *draw ā-bl*, that may be drawn. **DRAWBACK**, n. any loss of advantage in enjoyment, etc.; a certain amount of duties or customs on goods paid back. **DRAWBRIDGE**, n. a movable bridge over water (see **BRIDGE**). **DRAW-CUT**, n. an oblique motion of a knife, so as to move lengthwise across an object as well as cutting into it. **DRAW-FILING**, n. drawing a file longitudinally up and down a piece of metal, without giving the tool any movement in the direction of its length. **DRAW-KILN**, n. a lime-kiln arranged to afford a continuous supply of lime from below, fuel and limestone being fed in above from time to time; also called a Running-kiln, or Continuous kiln. **DRAW-LOOM**, n. in *weaving*, the predecessor of the jacquard; it is used in figure weaving. **DRAW-NET**, n. a net with large meshes, used for catching the larger varieties of fowls. **DRAW-PLATE**, steel plate with a graduated series of holes, through which metals are drawn in making them into wires or bars; also a plate of metal placed before a fire on a hearth, or before the lateral opening between the top of the fireplace and the throat of the chimney. Its use is to force the draft of air to pass through the fire on its way into the chimney, instead of allowing it to pass over the fire. **DRAW-POINT**, n. in *engr.*, the etching-needle used on the bare point; also called Dry-point. **DRAW-TUBE**, n. the adjustable tube of a compound microscope, having the eye-piece at its outer end, and the erecting-glass (if any) at its inner end. **DRAW'ER**, n. *-ĕr*, one who draws a bill of exchange (see **DRAFT: BILL**). **DRAW'EE**, n. *-ĕ*, the person drawn on by a bill of exchange. **DRAWER**, n. *draw'r*, a sliding box in a table. **DRAWER-LOCK**, n. a form of inside or mortise lock which projects its bolt upward into the strip above. **DRAWERS**, n. plu. *draw'rs*, light underclothing in the form of breeches or trousers. **CHEST OF DRAWERS**, a case of sliding boxes for containing clothes or household articles. **DRAW'ING**, n. the representation of a thing on a flat surface. **DRAWING**, the act of distributing prizes in a lottery by lots drawn; the selection of certain numbers by drawing them out of a box or wheel; in *metal*, the operation of hammering, rolling, or drawing through a die, by which a bar or rod of metal or a wire is extended in length to form a rod, tube, or plate; in *founding*, said of a pattern whose shape is such that it may be withdrawn from the sand without breaking the molded form; in *spinning*, the gain-



## DRAW.

ing of the mule-carriage; its progress after the feed is stopped draws out the yarn; in *fibre*, extending a sliver for the purpose of drawing its fibres parallel and increasing its length. DRAWING ACCOUNT, n. in *com.*, sum of money left in a banker's hands, upon which checks can be drawn at any time without notice. DRAWING-AWL, n. in *leather*, a leather-worker's awl, having a hole near the point in which the thread is inserted and pushed through in sewing, etc. DRAWING-BOARD, board on which drawing paper is strained for painting in water-colors, or for a sketch or design. For painting, the paper is wetted for the purpose of being strained, and when attached at the edges, it is permitted to dry and contract. Formerly, the drawing-board was fitted into a frame, the edges of the wet paper being made fast by the pressure of the frame on the board. But the much simpler board now in use is made of a flat piece or pieces of wood, held together and prevented from warping by an edging of other pieces, the grain of which runs in the opposite direction. The wet paper is attached to the edges of the board with paste or thin glue, and when dry becomes perfectly firm and flat. When the work is finished, the paper is cut beyond the drawing with a knife. DRAWING-COMPASS, n. an instrument with two legs, used for striking circles and curves. One leg has a pen or pencil, and it has several modifications, such as Bow-pen, Bow-pencil. Beam-compass, etc. Compasses for measuring and transferring measurements are called Dividers, Bisecting-compass, Proportional-compass etc. DRAWING-KNIFE, n. blade having a handle at each end, used by coopers, wagon-makers, and carpenters. It is usually operated in connection with a shaving-horse, which holds the stave, spoke, shingle, ax-handle, or other article which is being shaved; a tool used for cutting a groove as a starting for a saw-kerf. DRAWING-MASTER, one who teaches the art of drawing. DRAWING-PAPER, n. a variety of large white paper, made preferably of linen stock, and of 14 sizes. DRAWING-PEN, n. a pen for ruling lines, consisting, in its most usual form, of a pair of steel blades, between which the ink is contained, the thickness of the line being determined by the adjustment as to distance of the said blades. The ends of the steel blades are elliptical, sharp, and exactly even. DRAWING-PIN, n. a flat-headed tack for temporarily securing drawing-paper to a board; a thumb-tack. DRAWING-POINT, n. a steel tool for drawing straight lines on metallic plates; a scribe for metal; the draw-point or dry-point of an engraver makes its mark directly upon the metal and not at the etching-point, which makes a mark through a ground, the line being subsequently eaten into the metal by acid. DRAWING-ROOM [an abbreviation of *witndrawing-room*]: the room in a house set aside for the reception of company; the formal reception of company at the court of a sovereign. DRAW-WELL, a deep well from which water is drawn by means of a rope. DRAW IT MILD, in *slang*, don't exaggerate—said to have originated in the musical expression, 'to play piano or softly.' HANGED, DRAWN, AND QUARTERED, hanged, after which the heart is taken out,

## DRAWBACK.

the body is dismembered, and the quarters distributed—in *England* the punishment for treason, and still the law, though fallen into desuetude (the sovereign may, and now certainly would, by warrant change the sentence into beheading. Stephen's *Commentaries*, iv. 234: see TREASON). DRAWN-BRUSH, n. any brush in which the tuft or knot is drawn into the hole in the stock by a loop of copper wire. DRAWN-BUTTER, n. in *cook*, butter melted and prepared for use as gravy; melted butter. To DRAW BACK, to retire; to move back. To DRAW IN, to collect. To DRAW NIGH or NEAR, to approach. To DRAW OFF, to retire or retreat; to take from. To DRAW ON, to bring on; to entice; to seek or obtain payment by a written order or bill called a *draft*. To DRAW OVER, to cause to come over; to persuade or induce to leave one party or side to join another. To DRAW OUT, to lengthen or stretch; to take out of; to extract; to arrange in battle. To DRAW TOGETHER, to collect. To DRAW UP, to form in regular order.

DRAWBACK, in Commerce: duties or customs, remitted or paid back in part or whole by government, on certain classes of articles when they are exported. Excise duties enhance the price of the commodity on which they are imposed. Were these duties not remitted or drawn back, the commodity so taxed would not be ordered by those foreign countries where articles of the same kind could be purchased free of such duties: thus exportation would be checked. To afford facility for the exportation of such articles, the state resorts to the expedient of returning to the exporter a sum equal in amount to what he or the manufacturer had paid to the excise. Such is drawback. Adam Smith, in his *Wealth of Nations*, discusses the policy of giving drawbacks, and sees in them nothing adverse to a sound political economy. 'To allow,' he says, 'the merchant to draw back upon exportation, either the whole or a part of whatever excise or inland duty is imposed upon domestic industry, can never occasion the exportation of a greater quantity of goods than what would have been exported had no duty been imposed. Such encouragements do not tend to turn towards any particular employment a greater share of the capital of the country than what would go to that employment of its own accord, but only to hinder the duty from driving away any part of that share to other employments. They tend not to overturn that balance which naturally establishes itself among all the various employments of the society, but to hinder it being overturned by the duty: they tend not to destroy, but to preserve, what it is in most cases advantageous to preserve, the natural division and distribution of labor in the society.' Correct as is this view in general principle, it is claimed by some that the closer experience of the present day shows that the practice of giving drawbacks is liable to abuse; as, for example, when an excisable article falls greatly in value, and it is exported in order to get the D. with little or no reference to sales abroad, or in the hope that the D. will at least bring the amount of the freight. So far, therefore, the state is made to foster an



improper species of commerce. To prevent deceptions as far as is practicable, certain rules and formalities have to be attended to by exporters. For verification of the principal formalities required, the excise-officer concerned executes a certificate or debenture (q.v.), and under its operation the D. is paid by the revenue department.

**DRAWING**, in Art: delineating form, as distinguished from color and light and shade. The term is not confined to the first outline produced by the pencil or crayon, though this is a narrower sense in which it is also used, and what is usually meant by a drawing. In its wider sense, D. is used to describe what is in reality the most important feature of a finished painting of Raphael or Correggio, as well as an outline by Flaxman or Retch. D., in this sense, has been termed the grammar of art. But the analogy is incomplete; for the one quality requisite in the application of grammar, is correctness, whereas drawing, even when correct, even when faultless, admits of degrees of perfection. It may be more or less powerful, more or less free, more or less graceful; and, indeed, there is no characteristic in which the great artists of the Italian and Flemish schools more unmistakably excel all their successors, than in the power and beauty of their drawing. Neither is there any feature which more unmistakably stamps the individuality of the artist upon the picture.

**DRAWL**, v. *drawl* [Dut. *draelen*; Fris. *draulen*; Icel. *drolla*, to delay, to loiter: prov. Dan. *drøvle*, to be slow at one's work]: to utter words in a disagreeably slow tone: N. a long monotonous tone in speaking. **DRAW'LING**, imp. **DRAWLED**, pp. *drawld*. **DRAW'LINGLY**, ad. *-lī*.

**DRAWN**: pp. of **DRAW**, which see. **DRAWN-BATTLE**, a contest or fight in which neither side is the victor.

**DRAY**, n. *drā* [Sw. *drog*, a sledge, what is dragged along: L. *traho*, I draw]: a strong low cart on wheels; a sled or sledge. **DRAY-CART**, a brewer's cart. **DRAY-HORSE**, a heavy and strong horse. **DRAYMAN**, the man who attends on a dray

**DRAY**, or **DREY**, n. *drā*: the nest of a squirrel.

**DRAYTON**, *drā'ton*, **MICHAEL**: 1563-1631; b. Hartshill, Warwickshire, England. Of the events of his life little is known. He is supposed to have studied at the univ. of Cambridge, and to have been in the army when young. His earliest work, *The Shepherd's Garland*, was published 1593. He afterward published *the Barons' Wars, England's Heroical Epistles*, etc. *The Polyolbion*, the work by which he is best known, appeared 1613. He was poet-laureate in 1626. He was buried in Westminster Abbey. As a poet, D. is little known, save to readers such as Charles Lamb, who delighted in the obscure corners of literature. His *Polyolbion* is a topographical poem; and passages from it, now and then met with in county histories and works of an antiquarian character, surprise the reader with their stately rhythm, their nervous force, and their felicity of diction. Vols. I. II. and III. of a complete edition of



## DRAYTON—DREAD.

D.'s works, by the Rev. Richard Hooper, M.A., were published 1876.

DRAYTON, WILLIAM HENRY: 1742, Sep.—1779, Sep. 3; b. Drayton Hall, S. C.: statesman. He was educated at Westminster School and Baliol College, Oxford, returned to the United States and studied law 1764, was admitted to practice, and shortly afterward began publishing letters on current political topics. While in England, 1771, he was introduced to the king, who appointed him a privy councilor for S. C., Feb. 27. He returned, took his seat 1772, Apr. 3, was appointed assist. judge by Lieut. Gov. Bull, 1774, Jan. 25, and was suspended from crown offices by Chief-Justice Gordon for presenting the draft of a bill of rights to the first continental congress. In 1775 he became a member and pres. of the council of safety, and pres. of the provincial congress; 1776, a privy councilor and chief-justice of the state; 1777, pres. pro tem. of the state, and 1778, delegate to the continental congress. He left materials for a *History of the Revolution* which was edited and published by his son 1821.

DRAYTON-IN-HALES, or MAR'KET DRAYTON: town in the n.e. of Shropshire, on the Tern, 19 m. n.e. by n. of Shrewsbury, England. The people are chiefly agricultural. There are manufactures of paper, and of hair-seats for chairs. The parish church was built in Stephen's reign, but quite altered by repairs 1787. Here, 1459, the Yorkists defeated the Lancastrians. Pop. (1891) 10,292.

DREAD, n. *drēd* [AS. *dræd*; Sw. *rædas*, to fear: Sw. *rædd*; Scot. *rad*, afraid: OF. *dredré*, imitative of the chattering of the teeth]; great fear; apprehension of evil or danger; fear united with awe; the person or thing feared: ADJ. exciting fear; venerable in a very high degree; awful; terrible: V. to fear greatly; to be in great fear. DREAD'ING, imp. DREAD'ED, pp. DREAD'ER, n. one who. DREAD'FUL, a. *-fûl*, inspiring dread; terrible. DREAD'FULLY, ad. *-lî*. DREAD'FULNESS, n. DREAD'LESS, a. *-lēś*, fearless; undaunted. DREAD'LESSLY, ad. *-lî*. DREAD'LESSNESS, n. state of being without fear; intrepidity. DREAD-NAUGHT, n. in *fabrie*, a heavy woolen, felted cloth, used as a lining for hatchways, etc., on board ship; a kind of heavy goods for sailors' wear; a heavy overcoat or cloak made of dread-naught.—SYN. of 'dread, n.': awe; fear; terror; dismay; apprehension; affright; horror;—of 'dreadful': fearful; frightful; tremendous; horrid; horrible; terrific; formidable; awful; venerable.

## DREAM—DREAMING.

**DREAM**, *n.* *drēm* [Icel. *draumr*; Ger. *traum*, a dream, slumber; Dut. *droom*, a dream; AS. *drefan*; OE. *dretche*, to disturb or trouble—in the latter, especially by dreams]: thoughts or ideas occupying the mind during sleep; a vain fancy: *V.* to have ideas or thoughts in the mind during sleep; to think or imagine; to see in a dream. **DREAMFUL**, *a.* full of dreams, fancies, or idle thoughts. **DREAMILY**, *ad.* as if heard in a dream, softly; gently; slowly; sluggishly; negligently. **DREAM'ING**, *imp.*: *N.* the act of one who dreams; the mind engaged with thoughts during sleep. **DREAMED**, *drēmd*, or **DREAMT**, *pt.* and *pp.* *drēmt*. **DREAM'Y**, *a.* -*ī*, indistinct; full of dreams. **DREAM'LESS**, *a.* without dreams. **DREAM'ER**, *n.* one who; one lost in wild imaginations; a visionary. **DREAM'INGLY**, *ad.* -*ī*. **DREAM'LESSLY**, *ad.* -*ī*. **DREAM-LAND**, unreal events, or an imaginary country as pictured in dreams; region of fancies; fairy-land.

**DREAM'ING**: act or state of one whose mind is engaged with thoughts in sleep. In complete sleep, there is probably an entire absence of consciousness of external things. Usually, however, there is a certain amount of mental activity, of which the sleeper is more or less conscious at the time, and of which he has more or less subsequent remembrance. This is the state known as dreaming. Its chief feature is an '*absence of voluntary control over the current of thought, so that the principle of suggestion—one thought calling up another, according to the laws of association—has unlimited operation.*' The dreamer seems to perform all the actions of life; he experiences every kind of mental emotions, and sometimes his reasoning processes are remarkably clear and complete. Thus, when the mind, during sleep, takes up a train of thought on which it had been previously engaged during the preceding waking hours, intellectual efforts may be made during sleep impossible in the waking state. Such cases, however, are not common. To name two instances (quoted by Dr. Carpenter in his essay on Sleep in the *Cyclopædia of Anatomy and Physiology*): Condorcet saw, in his dreams, the final steps of a difficult calculation which had puzzled him during the day; and Condillac states that, when engaged with his *Cours d' Etude*, he frequently developed and finished a subject in his dreams which he had broken off before retiring to rest.

Occasionally, but not commonly, dreams seem to possess remarkable coherence and congruity in reference to the reasoning processes, or the combinations of the imagination. Most of our readers are probably acquainted with the incident narrated by Coleridge of himself, that his fragment, entitled *Kubla Khan*, was composed during sleep, which had come upon him in his chair while reading the following words in Purchas's *Pilgrims*: 'Here the Khan Kubla commanded a palace to be built, and a stately garden thereunto; and thus ten miles of fertile ground were inclosed within a wall.' Coleridge continued for about three hours apparently in a profound sleep, during which he had the most vivid impression that he had composed between

## DREAMING.

200 and 300 lines. The images, he says, 'rose up before him as things, with a parallel production of the correspondent expressions, without any sensations or consciousness of effort.' On awakening, he had so distinct a remembrance of the whole, that he seized his pen and wrote down the lines that are still preserved. Unfortunately, he was called away to attend to some business which lasted more than an hour, and on his return to his study, he found, to his intense mortification, that 'though he still retained some vague and dim recollection of the general purport of the vision, yet, with the exception of some eight or ten scattered lines and images, all the rest had passed away like the images on the surface of a stream into which a stone had been cast.' In other cases, a dream may leave a strong general impression on the mind, though particulars, even immediately on waking, cannot be recalled. Tartini is said to have composed the *Devil's Sonata* under the inspiration of a dream, in which the archfiend challenged him to a trial of skill. The dreamer lay entranced by the transcendent performance of his distinguished visitor; but on awakening and seizing his violin, though he was unable to reproduce the actual succession of notes, he produced from his general impressions the celebrated sonata.

Generally, however, dreams are wanting in coherence; all probabilities, and even possibilities of 'time, place, and circumstance' are violated. Friends long since dead appear and converse with us; and events long since past rise up before us with all the vividness of real existence. We may be conveyed to the antipodes, or even to worlds beyond our own, without the difficulty of the distance at all standing in the way. We are not aware of the grossest incongruities, probably because unable to test the probability of the phenomena by our ordinary experience; hence nothing that we see or do in a dream surprises us. Prof. Wheatstone observes, that 'we may walk along the brink of a precipice, or see ourselves doomed to immediate destruction by the weapon of a foe, or the fury of a tempestuous sea, and yet not feel the slightest emotion of fear; though during the perfect activity of the brain we may be naturally disposed to the strong manifestation of this feeling. Again, we may see the most extraordinary object or event without surprise, perform the most ruthless crime without compunction, and see what in our waking-hours would cause us unmitigated grief, without the smallest feeling of sorrow;' and Cicero, who long previously had made dreaming his study, justly remarks (*De Divinatione*, 59), that if it had been so ordered by nature that we should actually do in sleep all that we dream, every man would have to be bound down on going to bed. Occasionally, however, in place of this passive condition, the emotions may be highly excited; thus, for example, the sailor's wife is apt, especially in stormy weather, to dream of shipwreck, and to shriek with terror from its attendant miseries; and those who have once in their lives been exposed to some fearful danger, are apt to have the scene recalled to them in their dreams, either with all its appalling and lifelike



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exactness, or possibly in a grotesque and impossible modification.

Although the predisposing causes of dreams may be sought for in more than one direction, they are probably in general referrible to some peculiar condition of the body, and are often called into action through the agency of the external senses. Dr. Gregory relates, that having occasion to apply a bottle of hot water to his feet at bedtime, he dreamed that he was walking up Mount Etna, and found the ground insufferably hot. Dr. Reid having had a blister applied to his head, dreamed that he was scalped by a party of Indians. M. Gizon de Buzereinges made a series of pre-arranged experiments, to test how far he could determine at pleasure the character of his dreams. In his first experiment, having allowed the back of his head to be uncovered during sleep, he thought that he was at a religious ceremony in the open air; the custom of the country in which he lived being to keep the head covered, except on some rare occurrences, among which was the performance of religious ceremonies. On waking, he felt cold at the back of the neck, as he frequently had felt at the real ceremonies. He repeated the experiment in two days with the same result. In a third experiment, he left his knees uncovered, and dreamed that he was travelling at night in the diligence; and travellers know, he observes, that it is chiefly at the knees that they feel cold in that conveyance at night.

One of the most remarkable phenomena of dreaming, is the rapidity with which long trains of thought pass through the mind. A dream requiring hours for its accomplishment, is begun and terminated in a few seconds. A person who was suddenly aroused from sleep by a few drops of water sprinkled in his face, dreamed of the events of an entire life in which happiness and sorrow were mingled, and which finally terminated with an altercation upon the borders of an extensive lake, in which his exasperated companion, after a considerable struggle, succeeded in plunging him. Dr. Abercrombie relates a similar case of a gentleman who dreamed that he had enlisted as a soldier, joined his regiment, deserted, was apprehended, carried back, tried, condemned to be shot, and at last led out for execution. After all the usual preparations, a gun was fired; he awoke with the report, and found that a noise in an adjoining room had both produced the dream and aroused him from sleep. Dr. Carpenter mentions the case of a clergyman falling asleep in his pulpit during the singing of the psalm before the sermon, and awakening with the conviction that he must have slept for at least an hour, and that the congregation must have been waiting for him; but on referring to his psalm-book, he was consoled by finding that his slumber had lasted not longer than during the singing of a single line. Sir Benjamin Brodie, in his *Psychological Inquiries* (1854), mentions the following anecdote of the late Lord Holland: 'On an occasion when he was much fatigued, while listening to a friend who was reading aloud, he fell asleep and had a

## DREAMING.

dream, the particulars of which it would have occupied him a quarter of an hour or longer to express in writing. After he woke, he found that he remembered the beginning of one sentence, while he actually heard the latter part of the sentence immediately following it, so that probably the whole time during which he had slept did not occupy more than a few seconds.' Many facts of the same kind are on record, and as the author from whom we have quoted remarks, 'if we were to pursue this subject, it would lead us to some curious speculations as to our estimate of time, and the difference between the real and the apparent duration of life.' It is from cases of this nature that Lord Brougham has been led to the opinion, that *all* our dreams really take place in the act of falling asleep or of awaking. We cannot, however, explicitly accept this doctrine: 1. There is no sufficient proof of it: 2. We have a proof to the contrary in the fact, that it is common for people to moan and even talk in the middle of a sleep; and every one who has kept a dog must frequently have observed him dreaming (from the outward manifestations which he makes in the form of snarling or growling), though he remains asleep. Some, on the other hand, have argued that the mind can never be entirely inactive, and that every one is dreaming through the whole period of sleep, though the dreams may not be remembered in the waking state. We know of no facts that can be adduced in favor of this hypothesis, and the following case goes strongly to disprove it. A woman, aged 26, who had lost a portion of the scalp, skull, and dura mater, so that a portion of her brain was exposed to view, was a patient in 1821 in the hospital at Montpellier, France. When she was in a dreamless state, or in profound sleep, her brain was comparatively motionless, and lay completely within its bony case; but when the sleep was imperfect, and the mind was agitated by dreams, her brain moved and protruded from the skull, forming what is termed cerebral hernia. This protrusion was greatest when the dreams, as she reported, were most vivid; and when she was perfectly awake, especially if actively engaged in conversation, it attained its highest development, nor did this protrusion occur in jerks, alternating with recessions, as if caused by arterial action, but remained permanent while the conversation continued. If the *data* of this case are to be depended on, the appearance of the brain during profound sleep seems to indicate that during that state there is a total or nearly total suspension of the mental faculties.

The author of *Psychological Inquiries* suggests the question: Do dreams answer any purpose in the economy of living beings? We regret that he has not given us a definite answer, but he obviously inclines to think that they cannot be purposeless. No one has hitherto offered any certain explanation of the uses of the spleen, of the thyroid gland, or of the supra-renal capsules; yet no one believes the formation of these organs to be merely incidental, or doubts that they have some special (though at present unknown) function to perform. 'Dreams are,'



## DREAR—DREDGE.

he observes, 'at any rate, an exercise of the imagination. We may well conceive that one effect of them may be to increase the activity of that faculty during our waking-hours, and it would be presumptuous to deny that they may not answer some purpose beyond this in the economy of percipient and thinking beings.'

Dreams have, in all ages and countries, been believed in as indications of the future; and of all forms of superstition, this is perhaps the most excusable. Whatever is mysterious as to its cause, and beyond the power of the will, appears as supernatural; and what more so than dreams! The thoughts in dreams, too, arise out of the past and present circumstances of the dreamer, and therefore are not altogether without connection with his future destiny, as most other omens are. In the Homeric age, it was firmly held that 'dreams come from Zeus.' In the most ancient civilized communities of which we have any record—those of Egypt and Babylon—to interpret the monarch's dreams was one of the most important state offices, and was confided to a college of wise men. A common way of consulting the Greek and Roman oracles (q.v.), was for the inquirer to sleep a night in the temple, after performing sacrificial and other rites, when his questions were supposed to be answered in dreams. Grave philosophers wrote treatises on the interpretation of dreams, as they did on astrology. Even Bacon, though he confesses that the interpretation of dreams is mixed with numerous extravagances, yet speaks as if he thought that something might be made of it. In modern times, and among European nations, dreams are seldom heeded except by the very ignorant or superstitious; and 'as idle as a dream' has become a proverb. Nothing can be conceived more arbitrary than the pretended rules of interpretation; e.g., 'that to dream of gold is good-luck, but of silver ill.' See Brand's *Popular Antiquities*, by Ellis, where a *Dictionary of Dreams* is given. As to the actual coincidences that sometimes happen between dreams and events, it is only surprising, considering the countless fancies that are passing through our minds while asleep, that the coincidences are not ten-fold more numerous than they are.

**DREAR**, a. *drēr*, or **DREARY**, a. *drēr'ī* [AS. *dreorig*; Ger. *traurig*, sorrowful: Icel. *dreyrigr*, gory]: dismal; gloomy; distressful. **DREAR'ILY**, ad. *-lī*. **DREAR'INESS**, n. *-ī-nēs*, gloomy solitude. **DREAR'IMENT**, n. *-ī-mēnt*, in *OE.*, sorrow; melancholy; dread.

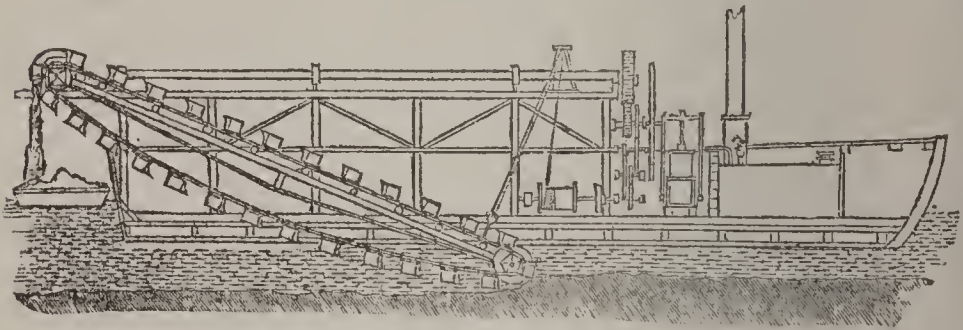
**DREDGE**, v. *drěj*, also **DRADGE**, n. *drāj* [Dan. *drysse*, to dredge, to sprinkle: OF. *dragée*, a powder to aid digestion; F. *dragée*, small shot: prov. Dan. *drasse*, to fall with a pattering noise: Scot. *drush*, atoms, fragments]: to scatter flour, etc., on meat while roasting: N. a mixture of oats and barley sown together. **DREDGING-BOX**, a box used for scattering flour over meat—generally called a *dredger*.

**DREDGE**, n. *drěj* [Dut. *dregghe*, a drag or grapple for sweeping the bottom of rivers, etc: Dut. *dregnet*, a drag-net—from *dragen*, to bear, to carry: F. *drège*, a kind of



## DREDGE.

net]; machine for dragging or dredging the bottom of seas, rivers, or lakes, in order to bring up oysters and other animals that lie on the bottom. The common oyster-dredge is a bag-net, made of iron rings, linked together to form the meshes; the mouth is of sheet-iron, which acts as a scoop when the dredge is let down and drawn along the bottom as the boat sails on. The dredge has of late been extensively used by naturalists with very important results, among the most remarkable of which are those obtained by the *Challenger* expedition, showing the existence of animal life in great variety at depths where it had before been considered impossible. The ordinary naturalist's dredge is of a lighter construction than that of the oyster-fisher, and its meshes are smaller. For dredging a sandy bottom, the best form is one like the net used by the Kentish shrimpers. These are twine nets, bag-shaped, and of the length of the boat. The lower side of the mouth of the net is stretched upon a wooden pole, and the other side is held up while the lower is drawn along the bottom. The quantity and variety of animals drawn up by these nets are astonishing. The dredge used for soles resembles the shrimp-net; but all dredges must be modified to suit the bottom on which



Section of a Dredging-machine.

they are used. See CHALLENGER EXPEDITION: ATLANTIC OCEAN: PACIFIC OCEAN: HYDROGRAPHY: SEA: SOUNDING, DEEP SEA.—DREDGE, *v.* to catch, take, or gather with a dredge; to deepen with a machine, as the bed of a river. DREDG'ING *imp.* DREDGED, *pp.* *drějd.* DREDGER, *n.* *drěj'ér,* one who, or that which. DREDG'ING, *n.* the operation of deepening the bed of a river, canal, etc. DREDGING-MACHINE, machine for clearing out or deepening the channels of rivers, harbors, etc. They are variously constructed, the simplest being like the oyster-dredge, only having a perforated cowhide bag instead of the chain-net, and a stronger 'spoon' or iron mouth to the bag. This is attached to the end of a pole, and worked with tackle by men from a barge in such a manner that the loose matter of the bottom is scooped up into the barge. The bucket dredging-machine is much more efficient. It consists of a long stage or framework overhanging the side of the barge. This frame has a wheel at each end, upon which works a powerful endless chain, to which is attached a series of perforated iron buckets, each with

## DRED SCOTT CASE—DREELITE.

a shovel-shaped steel mouth projecting considerably on one side. The overhanging framework forms an inclined plane, along which the buckets run, descending on one side, and ascending on the other. They are so arranged that they descend empty, and on reaching the bottom, the projecting shovel or scoop-mouth digs into the bottom, and partially fills the bucket with the silt; it then turns round on the wheel at the lower end of the incline, and runs up it till near the top, when it turns over the upper end, and in doing so its contents are emptied into a second attendant barge. This action is continued by every succeeding bucket of the endless chain. The perforations are for the escape of the water. By varying the inclination of the framework, the working depth may be increased or diminished. Some dredgers are fitted with two complete sets of buckets, one on each side of the vessel. A steam-engine and boiler, suitably placed in the dredge-boat are provided for giving motion to the machinery, sometimes also to a screw-propeller placed at the stern. The Clyde at and below Glasgow is a notable instance of river-dredging; it has been converted from a river navigable only for small vessels into an estuary bearing the largest ships. The dredgers are moved by steam, and the materials scooped out are carried out to sea by lighters, which have a large open tank amidships, while the two ends are decked over, and afford such accommodation for crew or machinery as may be necessary. The sides of the hold are hinged from the top, and open outward, and thus its contents can easily be emptied into the sea.

**DRED SCOTT CASE:** case of a slave, brought for final decision before the U.S. supreme court, 1856, which excited intensely earnest debate. The plaintiff was a negro named Dred Scott, who, with his wife and two children, had been held as slaves by Dr. Emerson, in Missouri. After the death of Emerson, Dred Scott with his family claimed to be free, on the ground that they had resided for some time with their late proprietor in a free territory—so that having, as Scott alleged, been free in that territory, they could not now be held to slavery. The result of the litigation, announced by Chief-Justice Taney, was, that Dred Scott and his family did not become free by having been taken to a free territory, and were accordingly still held to be slaves. The opponents of slavery denounced the law which could be open to such an interpretation, while public sentiment at the North was widely shocked by the terms used in setting it forth. The D. S. case was both indicative and preparatory of the tremendous conflict in which slavery went down.

**DREE**, *v.* *drē* [AS. *dreogan*; Icel. *drygja*, to endure]: in *old and prov. Eng.* and *Scot.*, to endure; to suffer. **DREE'**-**ING**, *imp.* **DREED**, *pp.* *drēd*.

**DREEITE**: see **DREELITE**.

**DREELITE**, *n.* *drē'līt* [after the Marquis de *Dree*]: one



## DREGS—DRENTHE.

of the heavy spars, generally occurring as a whitish crystallized vein-stone in lead-mines.

**DREGS**, n. plu. *drëgz* [Icel. *dregg*, sediment: Ger. and Dut. *dreck*, dung, dirt: OF. *draque*, draff]: the matter that settles at the bottom of a liquor; the sediment of liquors; lees; refuse matter; distillers' refuse used for cattle-feeding; the most vile and despicable part. **DREGGY**, a. *drëg'gì*, muddy; containing dregs or lees. **DREG'GINESS**, n. foulness; fulness of dregs. **DREG'GISH**, a. full of dregs; foul with lees.—**SYN.** of 'dregs': dross; sediment; scum; dirt; mud; trash; feculence; grounds.

**DREIBUND**: see **TRIPLE ALLIANCE**.

**DREICH**, or **DREEGH**, a. *drëch*, in Scotch, *ch* and *gh* guttural [Gael. *driachan*, slow]: in *Scot.*, tedious; slow.

**DREISSENA**, *drì-së'na*: genus of lamellibranchiate mollusks, generally regarded as belonging to the mussel family (*Mytilidæ*); though, while the shell much resembles that of the true mussels, the animal differs in having the mantle closed except at the anal and branchial slits, and a small aperture through which the foot and byssus protrude.—*D. polymorpha* is an interesting mollusk, because, having of late been accidentally introduced into British estuaries and canals, it has fully established itself, and is now abundant in many of them, and in the rivers with which they are connected. Originally, it is believed, a native of the rivers which flow into the Caspian Sea and Lake Aral, it has extended to the canals and rivers of Germany, Holland, etc. It is capable of living a long time out of water with its valves closed, and it is supposed that it may have been brought to Britain on timber imported from the continent.

**DREMOTHERIUM**, n. *drëm-o-thër'î-üm* [Gr. *dramein*, to run, and *therion*, a beast]: in *paleon.*, genus of animals allied to the musk-deer, found in the Miocene deposits of France and Attica.

**DRENCH**, v. *drënsht* [Icel. *dreckia*, to plunge in water: Sw. *dranka*, to plunge in water, to drown: Dut. *drencken*, to water beasts]: to wet thoroughly; to soak; to saturate; to purge violently: N. a dose of liquid medicine for purging a horse; a draught. **DRENCH'ING**, imp. **DRENCHED**, pp. *drënsht*. **DRENCHER**, n. *drënsht'ër*, one who or that which. **DRENCHING-APPARATUS**, n. a jaw-opener and head-lifter by which drenches may be administered to animals without their being able to bite the bottle or horn, or the arm of the operator. **DRENCHING-HORN**, n. a cow's horn, closed at the butt-end and perforated at the point-end (like a powder-flask), to administer drenches of medicine to ailing animals.

**DRENTHE**, *drën'tëh* or *drën'tî*: frontier province of the Netherlands; bounded on the e. by Hanover, on the n. and e. by Groningen, on the w. by Friesland, and on the w. and s. by Overijssel; lat. 52°37'—53°23' n., and long. 6°12'—7°10' e.; 1,030 sq. m. The soil is in general poor, only about one-half of the surface being capable of cultivation, the remaining portion covered chiefly with heath and morass.



## DREPANOPHYLLUM—DRESDEN.

The principal crops are rye and buckwheat, but barley and oats also are raised. The inhabitants are employed chiefly in agriculture, pasturage—the cattle reared in D. being famous—and in digging and exporting peat. Two pauper colonies in the west of the province, the Fredericksoord and Willemsoord, established 1818, are employed by the state in bringing waste land under cultivation, and in brick-making, weaving, and other occupations. Pop. of D. (1880) 119,884; (1890) 132,495; (1901) 153,281.

**DREPANOPHYLLUM**, n. *drĕp-a-nŏ-fĭl'lŭm* [Gr. *drepanon*, a sickle, a reaping-hook, and *phyllon*, a leaf]: in bot., a genus of terminal fruited mosses, the typical one of the family *Drepanophylleæ*.

**DRESDEN**, *drĕs'dĕn* or *drĕz'dĕn*: capital of the kingdom of Saxony, in a charming valley on both sides of the Elbe; lat. 51° 3' 16" n., and long. 13° 44' e. It is 116 m. s.e. of Berlin, and 72 m. e.s.e. of Leipsic. Pop. (1900) 396,146. It is composed of the Altstadt (Old Town), on the left bank of the Elbe; and of the Neustadt (New Town), on the right or n. bank. D. is a pleasant, though not exactly a beautiful town. There are several open squares in both the Old and New Towns. On account of its architecture and splendid collections in art, it has been justly called the 'German Florence.' Of the churches, the finest are the Frauenkirche, with a tower 335 ft. in height; the Rom. Cath. church (1737–56), with a celebrated organ by Silbermann, and numerous statues and pictures; the Sophienkirche; and the Kreuzkirche, with an altarpiece by Schöнау. The synagogue of the Jews, built in the oriental style by Semper, also is worthy of mention. Among important buildings are the Royal Palace, a shapeless edifice, begun by Duke George 1534, and completed by Augustus II.; the Prince's Palace erected by Augustus II. 1718; the Zwinger, only the vestibule of a palace in the almost too elaborate old French style of architecture, but containing many valuable antiquarian and scientific collections; the theatre, the academy, the Brühl Palace, etc. The Old and New Towns are connected by two bridges, both *chefs-d'œuvre* of architecture.

D. possesses many excellent educational and charitable institutions. The Acad. of Art was opened 1764; a school of architecture was added 1819. This celebrated institution and the musical choir give the city an artistic eminence.

The most important branches of industry are gold and silver manufactures, machinery, strawplait, paper-hangings, excellent painters' canvas, colors, artificial flowers, chocolate, porcelain, etc. An impulse was given to the corn-trade by the opening of the Corn Exchange in 1850.—The environs of D. are delightful.

The most important of the D. collections are: 1. The Royal Public Library in the Japan Palace, with nearly 350,000 vols. It contains many curiosities, and is complete particularly in the department of literary history and classical antiquity, as well as in histories of France and Germany.

## DRESDEN.

2. The Cabinet of Coins, likewise in the Japan Palace. 3. The Museum of Nat. History in the Zwinger, complete particularly in the mineralogical department. 4. The Historical Museum, formed 1833. 5. The collection of mathematical and physical instruments, likewise in the Zwinger. 6. The renowned Picture-gallery, containing upward of 1,500 paintings, mainly by Italian and Flemish masters. Among the former, those especially worthy of notice are the pictures of Raphael (*The Sistine Madonna*); of Correggio (*La Notte*, and the *Madonna of St. Sebastian*); of Titian (*The Tribute-money*, and *The Venus*); of Andrea del Sarto (*Abraham's Sacrifice*); of Francia; of Paul Veronese; of Giulio Romano (*The Virgin with the Pitcher*); of Leonardo da Vinci (*Francesco Sforza*); of Gaorfalo, Bellino, Pietro Perugino, Annibale Caracci, Guido Reni, Carlo Dolci, Cignani, etc. Of the Flemish school, the collection has 41 pictures by Rubens, 21 by Vandyck, many by Rembrandt, admirable specimens of Snyders, Johann Breughel, Ruysdael, Wouvermann, Gerard Dow, Teniers, etc. Of works of the German school, the gem of the collection is Hans Holbein's *Madonna*. Of the French school, several pictures by Nicolas Poussin, and some admirable landscapes by Claude Lorraine, are most remarkable. 7. The cabinet of Engravings in the Zwinger, arranged in 12 classes, marking distinct periods in the history of art. 8. The collection of Antiques in the Japan Palace, including several admirable sculptures. 9. The *Green Vault* in the Royal Palace, a valuable collection of precious stones, pearls, and articles wrought in gold, silver, and ivory. 10. The collection of Porcelain in the Japan Palace.

D. is known in history as far back as 1206. It is officially mentioned as a town 1216. Henry the Illustrious selected it for his capital 1270. From the close of the 15th c., its prosperity gradually increased. Several successive sovereigns contributed to its embellishment, particularly Augustus I. and Augustus II. It suffered severely, however, during the Seven Years' War; and again, 1813, when Napoleon selected it as the central point of his operations. During the revolution of 1849, also, immense damage was inflicted upon the town, but it is again rapidly improving. D. was occupied by the Prussians in 1866 during the Austro-Prussian war. Since that year the city has been enlarged and made more delightful. New streets have been opened; old irregular buildings have given way to handsome and imposing edifices. The foundation stone of the magnificent new Court Theatre was laid 1871.

DRESDEN, BATTLE OF: between Napoleon and the allies, 1813, Aug., when the war, after a short truce, broke out afresh, the armies of the allies gathered from all sides toward Dresden, which they regarded as the key of the French position. It was held by St. Cyr with a force of about 30,000 men, the main body of the French under Napoleon being in Silesia, where the emperor expected the contest was to be waged. Aug. 23, the grand army of the allies appeared before Dresden. The town would in all probability have been quickly stormed, had not Schwarz-



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enberg and the Austrians insisted on waiting the arrival of the left wing under Klenau. This delay saved the French; for on the 26th, at half-past nine in the morning, Napoleon with his Guards entered the town. At four in the afternoon, Schwarzenberg, commander-in-chief of the allies, gave orders for the attack. At various points, the assault was irresistible, but the opportune arrival of the 'Young Guard' enabled Napoleon to hazard a sally, as unexpected as it was successful. The allies fell back everywhere; but not dispirited, renewed the fight next day. Toward noon, Moreau was mortally wounded by a cannon-ball at Alexander's side on the height of Räcknitz, and Napoleon obtained a decided advantage over the left wing of the allied army, which Murat, by a skilful maneuver, contrived to outflank, taking 10,000 prisoners, among whom was General Metsko. Several other successes in other parts of the field determined the allied armies, especially after hearing that Vandamme was advancing toward Pirne, to retreat, which they did during the night of Aug. 27. Dresden, however, was not yet delivered from the miseries of war. When Napoleon finally quitted the city, Oct. 7, nearly 30,000 men still remained behind. As all access was cut off by the Russians, the city suffered severely from famine. A capitulation was at length brought about (1813, Nov. 11) between St. Cyr and Klenau, according to which the garrison were to withdraw unmolested, from Nov. 12-16, on condition that they laid down their arms. The capitulation was nevertheless rejected by Prince Schwarzenberg, the garrison declared prisoners of war, and treated as such. The battle of Dresden, as Alison observes, was the *last* pitched battle, on a scale commensurate with his former victories, that Napoleon ever gained.

**DRESS**, *n.* *drēs* [F. *dresser*, to make straight, to trim—from It. *drizzare*, to address or turn toward a place: Gael. *dreach*, to dress: L. *dirigēre*, to direct]: covering or ornaments for the body; garments; clothes; a lady's gown: **V.** to cover the body with clothing or ornaments; to deck, adorn, or embellish; to cultivate; to prepare food for the table; to put into good order, as a wound; to prepare or fit for use; in *mil.*, to adjust the front of a company to a straight line. in *fabrics*, to size yarn, cloth, or thread; to tease or raise the nap on woolen cloth; in *print.*, to arrange the form in the chase symmetrically; in *mill-work*, to prepare the surface of a mill-stone; in *masonry*, to prepare or smooth the surface of stonework; in *min.*, to prepare mineral ores for the furnace; in *metal*, to planish sheet-metal ware into symmetrical form on a stake or anvil. **DRES'SING**, *imp.* **DRESSED**, *pp.* *drēst*. **DRESS-COAT**, *n.* a swallow-tailed coat, or one with narrow pointed tails, worn by gentlemen in evening dress. **DRESS GUARD**, *n.* a wing at the side of the carriage entrance, to prevent the brushing of the dress against the wheel. **DRES'SER**, *n.* in *Scot.*, one who; a large table or bench in a kitchen on which things are dressed for use. **DRES'SING**, *n.* a preparation to fit for use; an application made to a wound; in *arch.*, loosely applied to moldings and all the simpler sculptured decorations. **DRESSING**, *n.* gum,



## DRESS—DREW.

starch, paste, clay, etc., used in the sizing of fabric, yarn, or thread; in *cook.*, the stuffing of fowls, etc.; forcemeat; in *foundry*, the act or process of clearing castings after they have been taken from the mold; in *type-found.*, the cleaning and notching of the letters after casting; in *familiar language*, a flogging or beating; in *OE.*, ornament; attire. **DRESSING-BENCH**, *n.* a bricklayer's bench, having a cast-iron plate on which the sun-dried brick is rubbed, polished, and beaten with a paddle in order to make it symmetrical. **DRES'SY**, *a.* -sī, showy in dress. **DRESSING-CASE**, a box fitted with toilet requisites. **DRESSING-GOWN**, an easy loose gown used in the morning before or while dressing. **DRESSING-ROOM**, an apartment in which a person may dress. **DRESSING-TABLE**, a table at which a person may dress, and on which articles for the toilet stand. **DRESS-MAKER**, *n.* one who makes ladies' dresses. **TOP-DRESSING**, matter, as manure, applied to land.—**SYN.** of 'dress, *n.*': attire; array; apparel; clothing; vesture; vestment; raiment; costume; habit; accouterments; robes;—of 'dress, *v.*': to rig; trim; prepare; arrange; align; adjust; decorate.

**DRESS**: collective name for the artificial coverings worn in greater or less quantity by all but the most savage of the human race, and always combining the two objects of warmth and ornament. It seems, indeed, from what is known of savage nations, that it is rather in the desire for ornament that the wearing of *D.* begins, than with a view to protection from cold (see **FASHION**, for some of the more singular caprices to which *D.* has been subjected; see also **CRINOLINE**: **BLOOMERISM**). The earliest coverings consisted of such articles as the skins of animals, and the leaves and inner bark of plants, which, as civilization advances, were mostly supplanted by various textures of wool, flax, silk, and other vegetable and animal substances: for these textures see the appropriate heads; for the regulation of *D.* with a view to health, see **HEALTH**.

**DREUX**, *dréh.*: ancient town of France, dept. of Eure-et-Loir, on the river Blaise, 22 m. n.n.w. of Chartres, 45 m. w. of Paris. It is moderately well built, at the foot of a hill crowned with the dilapidated ruins of an ancient castle, formerly the possession of the Comtes de Dreux. From among the ruins rises a beautiful chapel, in the form of a Greek temple, surmounted by a cupola, erected by Louis Philippe. It contains the tombs of two of the children of Louis Philippe, and of others of his relations. The town-hall and the parish church, both handsome specimens of Gothic, are the only other buildings worthy of note. *D.* has extensive manufactures of coarse cloth, serge, etc., with a trade in sheep and cattle, also various tan-yards, iron-foundries and dye-houses. In 1562, one of the bloodiest battles in the religious wars of France took place at *D.*, in which the Rom. Catholics, under the Constable Montmorency, defeated the Huguenots, and took their leader the Prince of Condé prisoner. Pop. (1891) 9,364.

**DREW**, *n.* *drū* [prob. from Icel. *drjúgr*, long, drawn out]:

## DREW—DREXEL INSTITUTE.

species of sea-weed, the narrow thong-shaped sea-weed, *Fucus loreus*; sea-laces, *Fucus* (now *Chorda*) *filum*.

DREW, DANIEL: 1797, July 29—1879, Sep. 18; b. Carmel, Putnam co., N. Y.: capitalist and speculator. In early life he was a cattle-drover, and after saving some money began building and operating steam boats on the Hudson river. Subsequently he became prominent in various railroad enterprises, particularly the Erie railroad, of which he was treas. for a time, and was afterward one of the most widely-known stock operators in Wall street. At one time his fortune was variously estimated at from \$5,000,000 to \$15,000,000, and in an emergency he loaned the Erie railroad company \$3,500,000, but in the latter part of his life he lost heavily by adverse stock operations and the failure of the firm of which he was a partner, and was forced to assign and go into bankruptcy. In his prosperous days he founded the Drew Ladies' Seminary at Carmel, N. Y., and the Drew Theol. Seminary (Meth. Episc.) at Madison, N. J., giving to the latter nearly \$1,000,000. He gave also a handsome sum to Wesleyan Univ., Middletown, Conn.

DREW THEOLOGICAL SEMINARY: at Madison, N. J.; founded as a theol. school of the Meth. Episc. Church by a gift of \$500,000 from Daniel Drew, 1866. A valuable piece of property belonging to the Gibbons estate and known as 'The Forest' was purchased, the commodious mansion slightly altered, and the institution opened 1867, Nov. 6, with John McClintock, D.D., LL.D., as pres. and prof. of practical theol., and Bernard H. Nadal, D.D., LL.D. as prof. of historical theology. Pres. McClintock died 1870, Mar. 4, and Prof. Nadal became acting pres., but lived only till June 20. Randolph S. Foster, D.D., the prof. of systematic theol., was then appointed pres. and served as pres. and prof. till 1872, May, when he was elected a bp. of the Meth. Episc. Church. He was succeeded by John Fletcher Hurst, D.D., prof. of historical theol., who was chosen 1873 and served till 1880, when the gen. conference of the church a second time honored the seminary by electing its pres. to the episcopacy. After Bp. Hurst's resignation, Henry Anson Buttz, D.D., LL.D., the George T. Cobb prof. of New Test. exegesis, was chosen pres. and still occupies the office (1902). The buildings of the institution now embrace the mansion, containing the recitation-rooms, 2 dormitories, the residences of four professors, and an entirely fire-proof library bldg. The lib'ry contains nearly 76,500 vols. The resident professors and instructors (1901-2) were 7, non-residents 3, students 180 and the alumni 998.

DREXEL INSTITUTE: in Philadelphia, founded by Anthony J. Drexel (q.v.), banker, for 'the extension and improvement of industrial education.' The building of the D. I., costing (with equipment) \$600,000, is the gift of the founder, who furthermore, on the day of the opening of the institute, 1891, Dec. 17, added an endowment fund of \$1,000,000. The building has a frontage of 125 ft. on Chestnut st. and 130 ft. on Thirty-second st. It has four



stories. On the ground-floor is the main hall 65 ft. square, surrounded on all sides by galleries leading from the four floors, and lighted from the roof. The floors are occupied by the library and reading-room, museum, lecture-hall, workshops, classrooms, laboratories, photographic and art studios, and gymnasium: accommodations are afforded for 2,000 students of both sexes. In the art dept. the course is like that of the South Kensington Museum, London; in the scientific dept. chemistry and physics are taught by lectures and in the laboratories; in the dept. of mechanic arts there is a three-years course of manual training, with drawing, mathematics, and science; the dept. of domestic economy is designed to train young women in household organization and management, and incidentally teaches such trades as cookery, millinery, and dressmaking. The technical dept., in effect a trade-school, gives separate courses in applied electricity, machine construction, mechanical drawing, photography, house-decoration, wood-carving, etc. In the business dept. are taught stenography, typewriting, book-keeping, business forms, etc. The normal dept. is designed to prepare graduates of this and other schools to be teachers of art, manual training, domestic economy, physical culture, cookery, sewing, millinery, etc. In all these depts. there are day classes; and there are evening classes in drawing, modelling, wood-carving, mathematics, physics, applied electricity, business practice, domestic arts. A very small fee is payable by the students, except those to whom the free scholarships (160 in number) are awarded. The gymnasium, library, and reading-room are available for use by both day and evening students.

DREYFUS, ALFRED: a French military officer; b. 1859; was trained in the Polytechnic School, Paris, and made a lieutenant of artillery, 1882; promoted captain, 1889. He was arrested 1894, and accused of selling military secrets to Germany and Italy. On 1895, Jan. 5, he was convicted and in the presence of 5,000 troops was degraded from his rank. He was then conveyed to the Isle de Diable, off the coast of French Guiana, under a sentence to serve a life imprisonment. In 1899 he was granted a new trial by court-martial, but was again convicted. He was, however, almost immediately pardoned. In 1900 his request that an inquiry be made concerning a new charge that he had written to Emperor William was refused. He published *Five Years of My Life* (1901).

DRIBBLE, v. *drīb'ł* [Dan. *draabe*, a drop; prov. Dan. *drible*, to drivel: Pol. *drob*, a diminutive thing: connected with DRIP, which see]: to throw down in drops; to fall in drops; to slaver, as a child or an idiot. DRIB'BLING, imp. -*ling*: ADJ. coming in small portions or drops. DRIBBLED, pp. *drīb'ld*. DRIB'BLER, n. -*lēr*, one who. DRIB'BLET, n. -*lēt*, a small quantity; a small piece or part; a small sum.

DRIED, DRIER: see under DRY.



## DRIFFIELD—DRIFT.

**DRIFFIELD**, *drif'fēld*, **GREAT**: chief town in the Wolds, in East Riding, Yorkshire, England, at the s. base of these hills, near one of the sources of the Hull, 28 m. e. by n. of York, 20 m. n.n.w. of Hull. It lies in a fertile district, and consists chiefly of one long and broad street. It has a chemical work, flour, and bone-mills, and a considerable corn and cattle trade. Near D. many ancient tumuli have yielded human and horse skeletons, accouterments, flint spear heads, urns, and a variety of ornaments. Pop. (1881) 5,937; (1891) 5,703.

**DRIFT**, n. *drift* [AS. *drifan*; Goth. *dreiban*, to move under the influence of an overpowering force: Ice. *drif*, a tempest: Dut. *drift*, a flock, course, current: Ger. *trift*, a drove]: that which is driven by wind or water and collected in heaps; overbearing power or influence; tendency; aim or scope; in *mining*, a passage cut between shaft and shaft, called the *driftway*; in *navigation*, deviation of a ship's course through the action of a contrary wind; in *arch.*, the push, shoot, or horizontal thrust of an arch or vault upon the abutments; in *ord.*, a priming-iron to clean the vent of a piece of ordnance from burning particles after each discharge; in *mach.*, a round piece of steel, made slightly tapering, and used for enlarging a hole in a metallic plate by being driven through it; in *pyrotech.*, a stick used in charging rocket-cases; in *ship-build.*, drifts in the sheer draft are where the rails are cut off and ended with a scroll. Pieces fitted to form the drifts are called drift-pieces; difference in size between a treenail and its hole, or a hoop and the spar on which it is driven; part of the upper stroke between the coach and the quarter-deck; in *Scot.*, a drove, applied as to sheep; in *geol.*, unstratified boulder soils and clay, a deposit of the Pleistocene epoch; called the Northern Drift, Glacial Drift, or Diluvial Drift, in allusion to its supposed origin (see **BOULDER-CLAY**): V. to be driven into heaps, as snow or sand; to be driven along by a current of water, as, the *ship drifts*; to drive into heaps. **DRIFT'ING**, imp. **DRIFT'ED**, pp. **DRIFT-ANCHOR**, n. *naut.*, a triangular frame of wood or other similar contrivance, having just sufficient buoyancy to float, to which a line that leads from the bows of the ship is attached. It keeps the vessel's head to the wind when dismasted, or when it is impossible to carry sail. **DRIFT-NET**, n. a fishing-net about 120 ft. long and 20 ft. deep; corked at the upper edge. Several of these may be connected lengthwise and attached to a drift-rope: the meshes 2½ in. and upward, according to the size of the fish. **DRIFT-PIECE**, n. in *ship-build.*, one of the upright or curved pieces of timber that connect the plank-sheer with the gunwale. **DRIFT-PIN**, n. a hand tool of metal driven into a hole to shape it; as the drift which makes the square socket in the watch-key. **DRIFT-SAIL**, n. a sail dragging overboard to diminish leeway; a drag or drag-anchor. **DRIFT-BOLTS**, steel bolts used to drive out other bolts. **DRIFT-WIND**, a wind that drives all before it. **DRIFT-WOOD**, wood carried by a current of water; specimens thus transported have been found in the marine strata of the Chalk, London

## DRIFT—DRIFT-SAND.

Clay, and other formations. BOREAL-, DILUVIAL-, and GLACIAL-DRIFT, names for the drift of the glacial or ice period. SPINDRIFT, n. *spin'*, in *Scot.*, the snow when drifted from the ground by the wind with a whirling motion.

DRIFT, n. *drift* [Dut. *drift*, a flock or herd—*lit.*, that which is driven, hence the road over which driven]: in *s. Africa*, a practicable ford over any river or stream, whether on rock or silt.

DRIFT-SAND, or SAND-DRIFT: sand driven and accumulated by the wind. Deposits thus formed are found occasionally among the stratified rocks, but compared with other strata they are few, though, from their anomalous character, an acquaintance with their phenomena is important to the geologist. Moving sands are at the present day, in many places, altering the surface of the land. In the interior of great dry continents, as Africa, India, and Australia, extensive districts are covered with moving sands. The continuous blowing of a steady wind in one direction often covers a rich tract with this arid material. But the influence of the wind on loose sand is most evident along low sandy coasts, where hills, called 'dunes,' are formed entirely of it; they sometimes attain considerable height, as 200 or 300 ft. Dunes (q.v.) are advancing on the French coasts of the Bay of Biscay at the rate of about 60 ft. per annum, covering houses and farms in their progress. Similar accumulations are forming on the coasts of Nairn, Cornwall, Wexford, and other parts of the British Isles. The



Section of Culbin's Sand-hill, in Nairnshire.

Culbin Sands, in Nairnshire, cover a large district which at a period not very distant was rich arable land. The prevailing wind is from the w., hence the hills are slowly moving easterly, at the rate of a mile in somewhat less than a hundred years. A singular stratification exists in these hills. The prevailing west wind lifts, or rather rolls the particles of sand up the gentle incline of the w. aspect of the hill, until they reach the summit, where they fall, forming a steep declivity to the e., equal to the angle of repose for sand. A shower consolidates the surface of the new bed, or a land breeze carrying fine dust separates it by a very thin layer of finer material from the one that follows, and thus, as the hill moves eastward, a regular series of strata is formed at a very high angle, as is shown by the diagram. The progress of the hill is represented by the dotted outline. Little can be done to arrest the progress of these devastating sand drifts. It has been recommended to plant *Carex arenaria* and similar sand-loving plants, which have long creeping roots; they certainly check to a considerable extent the influence of the wind.

*Downs* (q.v.) are less barren than dunes, being composed not so entirely of sand.



## DRILL.

**DRILL**, *n.* *dril* [primary signification, as in *thrill*, *trill*, *thirl*, a shivering, a turning round, and hence a piercing: Dut. *drillen*, to shake—also applied to the brandishing of weapons: old Dut. *drille*, a hole: comp. Gael. *druil*, to twirl, to roll together: F. *driller*, to glitter]: a pointed instr. for boring holes; the act of training in military exercises and use of arms: V. to pierce or bore with a drill; to train as a soldier by military exercises; to educate by repeated acts. **DRILLING**, *imp.* N. the practice or training military movements and use of arms; the act of practicing in mechanical arts, etc. in order to render efficient and skilful. **DRILLED**, *pp.* *drild*. **DRILL-BOW**, a small bow for rapidly turning a drill: **DRILL-CHUCK**, *n.* a chuck in a lathe or drilling machine for holding the shank of the drill. **DRILL-JAR**, *n.* a form of stone or well-boring tool in which the tool-holder is lifted and dropped successively. The drill-rod is raised sufficiently between each impulse to loosen the tool from its impression in the stone, and is then dropped to give a blow to the tool. **DRILL-PIN**, *n.* the pin in a lock which enters the hollow stem of a key. **DRILL-SERGEANT**, a non-commissioned officer who trains soldiers. **DRILLMASTER**, one who teaches drill by way of gymnastics.—*Drill*, is subject to numerous varieties, according to the number and organization of the men drilled at one time, and the kind of weapon to which the exercises relate. The infantry, the cavalry, and the artillery all have different kinds of drill. The militia and the volunteers differ from the regulars, if not in the kind of drill, at least in the circumstances under which it is carried on; the squad-drill, company-drill, and battalion-drill, vary both in the numbers concerned and in the routine of exercises. Likewise in the navy, the drilling of seamen varies in kind, according to the duties likely to be required. It is generally considered that four months' drill is required to fit an infantry recruit for service. The progress depends greatly on the intelligence of the men.

**DRILL** (*Cynocephalus leucophæus*): species of baboon (*q.v.*), native of Guinea, similar to the mandrill, but rather smaller and less ferocious.

**DRILL**: fine linen fabric of a satiny finish, used for summer dresses for gentlemen. Drills are worked with five shafts, except fancy patterns, which are wrought with eight shafts.

**DRILL**, in Mechanics: tools used for boring or drilling holes in metal, bone, ivory, hard-woods, etc. They usually are made of a square steel bar, flattened out at the cutting end; this part is brought to an angular point like a spear-head, and the cutting edges forming the angle are bevelled in the opposite directions. Those which have a projecting pin in centre, and chisel-shaped cutting edges on each side of the pin, are called 'centre bits.' There are various contrivances by which the drill is made to revolve. For drilling iron, steel, and large brass work, the lathe is commonly used, the drill being fitted into a



## DRILL.

square-hole chuck, and the work pressed against it while revolving by the screw and centre of the puppet. The *brace* or *drill-stock* is commonly used by carpenters for centre bits, and occasionally for metal work: this is a curved handle, made to revolve by the hand, while one end is pressed against the chest. Small drills for metal work are mounted with a *ferule* or pulley, or are fitted into a stock with such a pulley on it; a piece of cane or spring-steel is mounted with a string like an archer's bow, but loose enough to wind round the ferule. By drawing the bow lengthwise, the drill is made to revolve, and is at the same time pressed against the work by means of a *breast-plate*, held against the chest of the workman; this breast-plate has indentations upon it, which serve as sockets, into which the end of the drill-stock or drill works.

DRILL, v. *dril* [Gael. *drill*, a drop: W. *dryll*, a fragment: Sw. *dralla*, to scatter, to sow: W. *rhill*, a row or trench]: to let corn dribble along a furrow or channel like a trickling rill of water: N. in *agriculture*, a row of grain or seed sown or planted in a furrow; the trench or channel so sown. DRILL'ING, imp. DRILLED, pp *drild*. DRILL-BOX, the box containing the seed for sowing. DRILL-GRUBBER, -HARROW, and -PLOW, instruments used in drill husbandry. *Note*.—As a matter of fact, the dribbling of the corn along the furrow has the appearance of the trickling of water. Without doubt, however, the primary idea was the dotted appearance of the seeds in a row, as if *drilled holes*, then applied to the furrow or channel sown with corn.

*Drill* in agriculture is a small furrow for receiving seed, a row of plants grown in such a furrow, or a machine for depositing seed in rows; *drilling* is the method of sowing or planting seed in regular rows instead of broadcast or in hills. In a rude fashion drilling was practiced by the Chinese, Hindoos, and other ancient peoples both for the growing of garden plants and for the production of field crops. While it possesses marked advantages, the system has never been generally adopted, even in the most progressive countries, though of late it has been rapidly growing in popular favor. In England one or more machines for drilling grain had been invented earlier, but the first really practical implement for the purpose was constructed by Jethio Tull about 1701. A strong prejudice against innovations, together with the complicated nature and great expense of the machines, prevented their use to any extent until a much later period. Though using the same leading principles, modern drills are much simpler, are better made, and are furnished at very moderate prices.

The principal objections to drilling grain are the necessity of having fields smooth and free from large stones and other obstructions, the extra amount of time and labor required in fitting the land to receive the seed, and the cost of the machines. But, except on unusually rough land, these drawbacks are offset by very great advantages.

Among the merits of this system may be mentioned the great economy of seed. In the broadcast method of sowing much of the seed remains upon the surface of the

ground, where it falls a prey to birds or mice; or is so slightly covered that it cannot germinate and is consequently wasted. In drilling wheat or similar grains, only about one-half the quantity of seed is required that is needed if scattered broadcast. When seed is sown broadcast by hand it is unevenly distributed. In some places it will be thick, in others thin. In the thickly sown spots one plant interferes with the growth of its neighbor, while in the thin places weeds are almost certain to appear. With a good seed drill these evils are avoided. The machine can be readily gauged to sow the exact quantity of seed per acre desired and perfect regularity in its distribution is assured. Another evil inseparable from broadcast sowing, even when the best machines for sowing and covering are employed, is found in the unequal depth at which the seed is lodged in the earth. By the use of the drill perfect uniformity in this respect is secured. The seed being buried at the same depth will germinate at the same time, the plants will make a uniform growth, and come to maturity at the same period. But grain scattered broadcast will grow and ripen unevenly and the quality of the product, particularly in the case of wheat and barley, will be injured by this lack of uniformity. Another advantage in drilling grain is found in freer admission and circulation of heat, air, and sunlight, which it insures and which causes a vigorous growth and increases the ability of the plants to withstand attacks of insects or diseases. The straw also grows much stronger and the falling down, or 'lodging,' of the grain by which many crops on rich soils are injured, is in a great measure prevented. Grain that is drilled will tiller much more than that which is sown broadcast, the stalks will grow taller and the heads will be longer and heavier, the yield of grain will be larger and the quality decidedly better. Drilling also admits of the cultivation of grain during the period of its growth. This is impossible where broadcast sowing is followed. Yet cultivation is probably as beneficial to grain as to the planted crops to which it is invariably given. It promotes the rapid growth of the plants, tends to prevent injury from drought, and destroys many weeds which, if left to mature, would injure the crop, rob the soil, and fill the land with foul seeds, occasioning much trouble in after years.

In England, where drill husbandry has made much greater progress than elsewhere, machines of various sizes and patterns, some very elaborate and expensive, have found considerable sale. In this country several admirable styles of drills, sowing from three to nine rows at a time, are manufactured, and are in considerable demand. Of these a very few are combined seeders and cultivators, allowing the seed to be sown and the plants cultivated with a single machine. As the population becomes more dense, and the necessity of utilizing the land in the best possible manner grows more imperative, the drilling of grain will, to a great extent, take the place of the imperfect methods of seeding which have thus far prevailed.

DRIMYS: see WINTER'S BARK.



## DRINK—DRINKING USAGES.

DRINK, n. *drīngk* [Goth. *drigkan*; Icel. *drecka*; Dan. *drikke*, to drink; Icel. *dreckia*, to sink under water]: any liquid taken into the mouth and stomach for quenching thirst; a beverage; a draught; a potion: V. to swallow a liquid, as water; to suck in; to absorb; to take alcoholic liquors; to be intemperate. DRINK'ING, imp.: ADJ. pertaining to the use of intoxicating liquors: N. the act of swallowing or absorbing; the practice of partaking to excess of intoxicating liquors. DRANK, pt. *drūngk*. DRUNK, pp. *drūngk*, intoxicated. DRUNKEN, a. *drūngk'ēn*, intemperate. DRINK'ER, n. one who drinks. DRINKER-MOTH, n. in *entom.*, a popular name for *Odonestis potatoaria*, a genus of large moths belonging to the family *Bombycidae*: see SILK and SILKWORM. It derives its name from the palpi, which are long, forming a beak in front. It is of a dull reddish or yellow color. DRINKING BOUT, n. a set-to at drinking; a revel. DRINK IN, to absorb; to receive with avidity, as through hearing or sight. TO DRINK OFF, to drink the whole at a draught. TO DRINK TO, to salute or wish well to any one by drinking liquor. TO DRINK UP, to drink the whole. DRINKABLE, a. *-i-bl*, fit or suitable for drinking. DRINK'ABLENESS, n. *-bl nēs*. DRINK'LESS, a. without drink. DRINK-OFFERING, an offering of wine, etc., in the religious services of the Jews. *Note*.—DRINK is connected with *drench* and *drown*: prov. Eng. *drake* or *drack*, to wet thoroughly.

DRINK'ING USAGES: social or religious customs in partaking of wine or strong drink; connected with the history of manners. Some of them are of great antiquity. Besides sacrifices of animals and articles of food, the Hebrews made drink-offerings a solemn religious service. 'To mark the spot where Jacob communed with God, he set up a pillar of stone, and 'poured a drink-offering thereon.'—Gen. xxxv. 14. Such sacrifices were not made to the true God alone; for women are said to have poured out 'drink-offerings unto other gods.'—Jer. vii. 18. Such a statement is amply verified by pagan writers. Among the Greeks and Romans, the pouring out of a libation to the gods was a common religious observance. A libation was made on the occasion of solemn prayers, also before meals: these libations were usually of undiluted wine, but they were also sometimes of milk diluted with water, or water flavored with honey. There are many references to these libations by Sophocles, Æschylus, Pliny, and other writers. The libation at meals consisted of pouring a small quantity of liquor from the cup on the ground—so much waste being a kind of propitiation, or an act somewhat equivalent to the asking of a blessing. See SACRIFICE.

From these and similar usages in remote times sprang the ceremonial observance of drinking healths, or the uttering of a pious, heroic, or friendly sentiment before quaffing liquor on festive occasions. It has been stated that the practice of pledging, or saying 'I pledge you,' originated in England in the 10th c., it being then necessary for one to watch over the safety of his companion



## DRINKING USAGES.

when the cup was at his lips. But the custom of drinking healths is of far higher antiquity, and was derived immediately from the boisterous convivialities of a Scandinavian and Teutonic ancestry (see VALHALLA), if not with equal likelihood from the usages of the early Britons, who were of Celtic origin. A story is told of a feast given by Hengist (5th c.) at his stronghold of 'Thong-caster, in Lincolnshire, to the British king Vortigern, and of the bewitchment of the royal guest by the charms of Rowena, the young and beautiful daughter of his entertainer. Rowena's address, as she gracefully knelt and presented the wine-cup to the king, *Liever kyning, wass heal*, or, 'Dear king, your health,' is often quoted as the origin of the still existing expressions, wassail and wassail-cup; though wassail means pledging or health-drinking independently of the saying of Rowena, and certainly was not then uttered for the first time. Wassail is derived from the old Anglo-Saxon *Wæs hæl*, 'Be in health;' and *Was heil* and *Drinc heil* were the usual ancient phrases in quaffing among the English, and synonymous with 'Here is to you,' and 'I'll pledge you,' of later times. The explanation of wassail by an old writer, Robert de Brunne, may be appropriately quoted:

'This is ther custom and her gest  
When thei are at the ale or fest,  
Ilk man that levis qware him think  
Salle say *Wosseille*, and to him drink.  
He that biddis salle say, *Wassaile*,  
The tother salle say again, *Drinkaille*.  
That says Wosseille drinkis of the cop,  
Kissand his felaw he gives it up.'

The learned Selden, in a note on the *Polyolbion*, says: 'I see a custom in some parts among us; I mean the yearly Was-haile in the country on the vigil of the new year, which I conjecture was a usual ceremony among the Saxons before Hengist, as a note of health-wishing (and so perhaps you might make it Wish-heil), which was expressed among other nations in that form of drinking to the health of their mistresses and friends. *Bene vos, bene nos, bene te, bene me, bene nostram etiam Stephanium*, in Plautus, and infinite other testimonies of that nature in him, Martial, Ovid, Horace, and such more agreeing nearly with the fashion now used; we calling it a health, as they did also in direct terms.' For further particulars concerning wassail and wassail-bowl, see Brand's *Popular Antiquities*, edited by Ellis. It is enough here to quote from that authority the following passages. 'Milner on an ancient cup (*Archæologia*, xi. 420), informs us that the introduction of Christianity among our ancestors did not at all contribute to the abolition of the practice of wassailing. On the contrary, it began to assume a kind of religious aspect, and the wassel-bowl itself, which in the great monasteries was placed on the abbot's table, at the upper end of the refectory or eating-hall, to be circulated among the community at discretion, received the honorable appellation of 'Poculum charitatis.' This, in our universities, is called the grace-cup.' The poculum charitatis is well

## DRINKING USAGES.

translated by the toast-master of most of the public companies of the city of London by the words, a "loving cup." After dinner, the master and wardens "drink to their visitors, in a loving cup, and bid them all heartily welcome." The cup [a silver flagon containing warm spiced wine] then circulates round the table, the person who pledges standing up while his neighbor drinks to him.'

While the drinking of healths is thus of old date, the application of the word 'toast' is modern, having had its origin in the practice of putting a piece of toasted bread in a jug of ale, hence called 'a toast and tankard.' The custom of so using the word is said to have had its rise at Bath, in the reign of Charles II. It happened that on a public day a celebrated beauty of those times was in the cross [or large public] bath, and one of the crowd of her admirers took a glass of the water in which the fair one stood, and drank her health to the company. There was in the place a gay fellow half-tipsy, who offered to jump in, and declared, though he liked not the liquor, he would have the toast. He was opposed in his resolution; yet this whim gave foundation to the present honor which is done to the lady we mention in our liquors, who has ever since been called a toast.—*Tatler*. Begun in the form of toasting beauties at private parties, toasts were in time given on all sorts of subjects at public festivities, accompanied with rounds of cheers and hurrahs, these noisy demonstrations being now called 'the honors.' The fatigue of announcing these exciting sentiments is so great, that in all well-ordered large assemblies a toast-master is employed. Standing behind the chairman, this official, beside proclaiming the toasts, acts as a fogleman to regulate the clapping of hands and the 'hip, hip, hurrahs' of the company. 'Toasts, certainly, in this guise look more like a medium for taking an indefinite quantity of wine, than that spontaneous effusion of the heart in honor of some cherished individual, which they originally were. On certain occasions, these signals are hushed, and the convivial glass is taken "in solemn silence." The effect is certainly rather startling. A convivial glass to the memory of one departed has surely something in it of practical absurdity.'—Mrs. Stone's *Chronicles of Fashion* (1845). The absurdity of the whole toasting system has incurred the reprehension of temperance societies, without any perceptible abatement; but the old custom of drinking healths at private parties is now given up in good society, with the excesses which were formerly practiced.

As to drinking usages in connection with domestic events and social intercourse, there were, as is well known, drinkings on the occasion of births, baptisms, marriages, and even deaths; these last, which included the gloomy festivities of the *Lykwake*, or wake over the corpse of the deceased, being a relic of a very ancient custom, as was that, at least in Scotland, of drinking the *dredgy* (dirge) after the funeral solemnities were completed. In whatever manner these, as well as many other drinking usages, originated, it cannot be doubted that they were long main-



## DRINKING USAGES.

tained from the force of custom, with that demand for artificial stimulus provoked by the naturally phlegmatic character of a northern people. For the long nights of a cheerless climate, there seems to have been sought the solacement of those intoxicating agents, in which it would have been fatal to indulge under the sunny skies of the south. This is probably the philosophy of the subject, if there be any philosophy in it; and it cannot fail to be observed, that in proportion to an increase in the number of comfortable homes, the cultivation of mental resources, and the spread of a taste for harmless recreations, the more odious of the old convivialities disappear. Latterly, many amusing traditions respecting the drinking habits of a past age in Scotland, where they longest flourished without alteration, have been given in the *Memoirs of Lord Cockburn*, the *Autobiography of the Rev Dr. Alexander Carlyle*, and the *Reminiscences of Scottish Life and Character*, by the Very Rev. Dean Ramsay (1860).

As regards miscellaneous drinking observances formerly common, perhaps the most offensive of all was that customary among tradesmen of imposing fines to be consumed in liquor. Apprentices, on being introduced to a workshop, paid so much entry-money to be spent in drink, and similar exactions were made from journeymen on entering a new employment. This was called paying their *footing*. When Benjamin Franklin, on his getting employment in a printing-office in London, refused to comply with this mischievous custom, he experienced, as he tells us, a variety of petty annoyances. Among shipwrights, the penalty of non-payment was flogging with a hand-saw from time to time, and other mal-treatment. See Dunlop's *Drinking Usages of Great Britain* (1839) for many curious details of this kind. The abolition of these usages has kept pace with the increasing intelligence of the working-classes, and of such outrages little is now heard. Prisoners, on being lodged in jail, as related in the novels of Smollett and others, were obliged to pay *garnish* for drink to the brotherhood of which they had become members. This pitiless exaction is now totally gone, through the efficacy of modern prison-discipline.

The giving of *vails* [Lat. *vale*, farewell] to servants on quitting a gentleman's house, which became so intolerable in the 18th c., as at length to be given up by universal consent, meant, doubtless, a gift to be spent in drink to the health of the donor, and was analogous to the custom of giving a *trink-geld* in Germany, and a *pour boire* in France, to servants, drivers of carriages, and others. There were, at one time, numerous drinking usages connected with departures. We need only notice the *bonailie* [Fr. *bon allez*], or, as it is sometimes called, a *foy* [Fr. *voie*], a festive drinking at the away-going of servants or of persons in a still higher degree, once common in the Lowlands of Scotland; also the *stirrup cup*, or, as it is called in the Highlands, *deoch an dorris*, or drink on getting on horseback, and being ready to set off.—For the moral and physical evils con-



## DRIP—DRIVE.

nected with drinking usages, and the means taken to redress them, see TEMPERANCE: TOTAL ABSTINENCE.

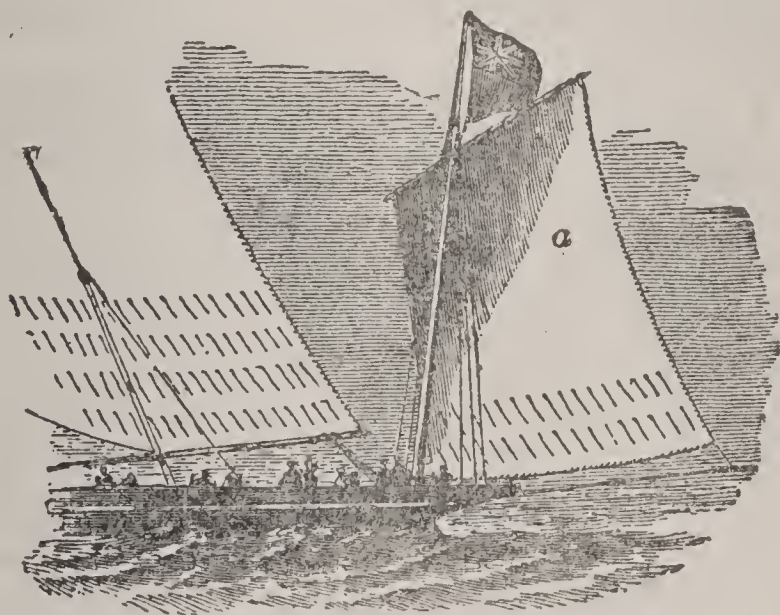
DRIP, *v.* *drip* [AS. *drypan*, to drip: Icel. *driupa*; Dut. *druppen*, to fall in drops: Lith. *dribti*, to hang, to fall as snow: comp. Gael. *druaip*, lees, dregs]: to fall in drops; to let fall in drops; to have a liquid falling from it in drops, as a wet garment *drips*: N. that which falls in drops; the edge of a roof; the eaves; projecting edge of a molding, so channelled as that the rain will drip from it instead of trickling down the wall. DRIP'PING, *imp.* DRIPPED or DRIPT, *pp.* *dript*. DRIP-JOINT, *n.* in *plumbing*, a mode of uniting two sheets of metal in roofing where the joint is with the current, so as to form a water-conductor. DRIP'PING, *n.* the fat from meat while roasting. DRIPPING-PAN, a pan for receiving the fat from meat roasting. DRIPS, *n.* plu. steps made in flat roofs or gutters. DRIP-STONE, a projecting slab or molding to throw off the rain; placed over the head of a Gothic door-way or window; known also as a water-table or weather-molding. Though such was, no doubt, its primitive use, the drip-stone latterly became a mere ornamental appendage, which served to enrich and define the outline of the arch. It does not generally extend lower than the springing of the arch, though this rule is not without exceptions. When the tracery extends to a lower level, the external drip-stone usually accompanies it, and Parker mentions that, at the n. doorway of Otham Church, Kent, it descends the whole length of the jamb. The dripstone is not so constant a feature in continental as in English Gothic.

DRISLER, *dris'ler*, HENRY, LL.D.: b. Staten Island, N. Y., 1818, Dec. 27: educator. He graduated at Columbia College 1839, was classical instructor in its grammar school several years, and was appointed tutor of Greek and Latin in the college 1843, adjunct prof. in the same dept. 1845, prof. of Latin 1857, and prof. of Greek to succeed the late Charles Anthon, LL.D., 1867. He was associated with Dr. Anthon in the preparation of a standard series of classical text-books; edited an enlarged edition of Liddell and Scott's Passow's Greek Lexicon 1846, and was associate editor of the 7th revised Oxford edition 1883; edited an enlarged edition of Yonge's *English-Greek Lexicon* 1870; D. 1897, Nov. 30.

DRIVE, *v.* *driv* [AS. *drifan*; Goth. *dreiban*; Ger. *treiben*, to urge forward, to move under the influence of an overpowering force: Icel. *dreifa*, to scatter]: to impel or urge forward by force; to compel; to guide or regulate, as the horses in a carriage; to pass from one place to another in a vehicle; to distress; to press; to be forced along; to rush or press with violence; to be moved by any force; to tend to; to aim at, in *cricket*, to hit the ball forward in front of mid-wicket; in *shoot.*, to force game from a covert toward the guns; in *min.*, to cut or dig horizontally; to make a drift in; *drive* is the reverse of *lead*: N. a ride or excursion in a carriage; the road passed over; in *forging*, a matrix formed by a steel punch, die, or drift; DRI'VING, *imp.* DROVE, *pt.*

## DRIVE.

*drôv*. DRIVEN, pp. *driv' n*. DRIVER, n. *drî'vër*, one who, or that which. DRIVER, on *shipboard*, large sail, occasionally set upon the mizzen-mast with a yard or gaff. A boom, called the *driver-boom*, extends the lower part of the sail some distance over the stern, like a cutter's mainsail. DRIVER, in *ship-building*, the foremost spur in the bulge ways, the heel of which is fayed to the fore-side of the foremost poppet, and the sides placed to look fore and aft in a ship; in *turning*, a bent piece of iron fixed in the centre-chuck, and projecting so as to meet the carrier or dog on the mandrel to which the work is attached; in *weaving*, the piece of wood which impels the shuttle through the shed of the loom: DRIVE-BOLT, n. a drift; a bolt for setting other bolts home or depressing the heads below the general surface. DRIVEN-WELL, n. well formed of a tube driven into the ground until its perforated end reaches a stratum containing water. DRIVER-ANT, n. in *entom.*, *Anomma arcens*, species of ant, so called from its driving before it almost any animal which comes in its way; native of w. Africa. DRIVER-BOOM, n. *naut.*, the boom to which the driver is



*a*, the Driver.

hauled out. DRIVER-SPANKER, n. *naut.*, same as DRIVER. DRIVING-BOX, n., the journal-box of the axle of a driving-wheel. DRIVING-GEAR, n. that portion of a machine which is especially concerned in the motion; as the parts from the cylinder to the wheels, inclusive, of a locomotive; the ground wheel to the cutter-bar pitman, inclusive, of a harvester; the hand-crank and gearing of a winch or crab, etc. DRIVING-NOTES, n. in *mus.*, syncopated notes; notes driven through the ensuing accent. DRIVING-SHAFT, n. a shaft communicating motion from the motor to the machinery. Shafting transmits power, but the driving-shaft is more immediate to the power; the motor. DRIVING-WHEEL, or DRIVER, the wheel in a machine which communicates motion. TO DRIVE AWAY, to scatter, to force to a distance. TO DRIVE OFF, to force to remove to a distance; to depart,



## DRIVEL—DROGHEDA.

as in a carriage. To DRIVE OUT, to expel. To DRIVE A BARGAIN, to haggle about the terms. To DRIVE A TRADE, to carry on a trade.

DRIVEL, n. *driv'l* [Gael. *dripel*, confused, indistinct: Icel. *drafl*, loose, idle talk: Sw. *dräfwel*, nonsense: Low Ger. *draueln*, to speak in a childish, foolish manner]: slaver; saliva or spittle from the mouth: V. to let the saliva drop from the mouth; to slaver; to be weak or foolish. DRIV'ELLING, or DRIV'ELING, imp. *driv'ling*. DRIVELLED or DRIVELED, pp. *driv'ld*. DRIVELLER or DRIVER, n. *driv'ler*, a fool; a dotard.

DRIVEN, v. and DRIVER, n.: see under DRIVE.

DRIVING, FURIOUS: formerly often an offense at common law, now a statutory offense in Britain, the United States, and some other countries.

DRIZZLE, v. *driz'l* [Ger. *rieseln*; Dan. *drasle*, to purl, as a brook, to fall in grains, as snow or small rain: Sw. *droseln*, to make a rattling or rustling noise in falling]: to rain in small drops or fine rain. DRIZZLING, imp. *driz'ling*. DRIZZLED, pp. *driz'ld*. DRIZZLY, a. *driz'li*, shedding a fine or light rain.

DROG, or DROGUE, or DROUGUE, n. *drög* [perhaps from *drag*]: a buoy, or square piece of wood, attached to the end of a harpoon line to check the speed of the whale when running or sounding.

DROGER, or DROGHER, n. *drög'ër* [F. *droguer*, a boat for catching and drying herrings: Dut. *droog*, from *drogen*, *droogen*, to dry]: a W. India cargo boat, employed in coasting, having long, light masts and lateen sails.

DROGHEDA, *drö'h'chè-da* (F. 'bridge of the ford'): well-built parliamentary and municipal burgh and sea-port, in a county by itself of nine sq. m., on the borders of Meath and Louth; on both sides, but chiefly n. of the Boyne, 4 m. from its mouth, 31 m. n. of Dublin. The Dublin and Belfast railway crosses the Boyne here by a viaduct 95 ft. high. There are linen and cotton manufactures, tanning and brewing works, and an iron-foundry. It has considerable trade, chiefly with Liverpool, 140 m., principally in corn, meal, flour, cattle, provisions, linen, hides, and butter. Great quantities of ale are sent to the colonies. Vessels of 500 tons reach the quay, and barges of 50 tons ply 19 m. up the Boyne to Navan. D. sends one member to parliament. The parts of D. on the opposite sides of the river formed two opposing corporations till 1412, when a sermon by a monk induced them to get a charter of union from Henry I. From the 14th to the 17th c., D. was the chief military station in Leinster. Many parliaments were held in D., and it had the right to coin money. Poyning's laws were enacted here. The English parliamentary army twice besieged D., and were repulsed; but in 1649, Cromwell stormed it and put 2,000 of the garrison to the sword. In 1690, after the decisive battle of the Boyne, at Oldham, 2½ m. to the west, D. surrendered to the forces of William III., upon the threat that if the town were taken by storm no



## DROGUE AMÈRE—DROITWICH.

quarter would be granted. One of the four ancient gates of D. remains, and ruins of many monastic institutions are still seen. A handsome hall was recently presented to the town. Two newspapers are published here. The harbor receipts in 1877 were £5,000. Pop. (1881) 13,510; of whom 12,381 were Rom. Cath; (1891) 11,873

**DROGUE AMÈRE**, *drög a-mër'* (Fr., bitter drug): celebrated stomachic bitter; of which the basis is creat root, and the other ingredients mastic, frankincense, myrrh, and aloes, all steeped for about a month in brandy, which is then strained and bottled.

**DROHOBICZ**, *drö'hō-bitch*: town of Austria, province of Galicia, on the Tyszmanika, a tributary of the Dniester; lat. 49° 25' n., and long. 23° 30' e. The town is in general ill built, but contains several interesting edifices, including a Basilian monastery, a castle, a high school, and two very handsome churches. D. has extensive salt-works, which produce about 3,700 tons of salt yearly. There are in the vicinity iron-mines and pitch-wells. D. has good trade in wine, linen, cotton, leather, and grocery. It has corn and cattle markets. Seven-eighths of the people are Jews, who carry on most of the commerce of the town. Pop. (1880) 15,714. (1890) 17,784.

**DROIL**, v. *droyl* [Icel. *dríole*, a slave; *drjóli*, a sluggard]: in *OE.*, a sluggard; a drudge: V. to work sluggishly; to plod. **DROILING**, imp. **DROILED**, pp. *droyld*.

**DROIT D'AUBAINE**, *droi do-bān'*: peculiar right of the king of France, who by the old custom of the kingdom was entitled, on the death of a foreigner who had taken up his fixed residence there, to claim his movable estate, notwithstanding any testamentary settlement which he might have left. But when a foreigner went to France as a traveller, merchant, or foreign minister, without any intention of fixing his residence there, the droit d'aubaine was excluded. The Swiss, Savoyards, Scotch, and Portuguese were exempted. This antiquated piece of injustice was abolished 1819.

**DROITS OF THE ADMIRALTY**: see **ADMIRALTY DROITS**.

**DROITURAL**, a. *droyt'u-ral* [F. *droiture*]: in law, pertaining or relating to a right to property, as distinguished from possession.

**DROITWICH**, *droyt'itch*: parliamentary and municipal borough in Worcestershire, England, containing four parishes and three churches; seven miles n.n.e. of Worcester, in the narrow valley of the small river Salwarp, on the Bristol and Birmingham and West Midland railway, and on a canal connected with the Severn which admits vessels of 60 tons. It has direct communication, also, by other canals, with Birmingham and London and the intermediate district. Its chief trade is salt, for which it has been famous from remote times, and which is esteemed the best in Europe. In the middle of the town, rising from a depth of 200 ft., through beds of new red-sandstone and gypsum,

## DROITZSCHKA—DROMEDARY.

re the celebrated wycles, or brine-springs, yielding over 115,000 tons of salt a year, nearly half of which is exported. D. sends one member to parliament. It was the Roman *Salinæ*. The remains of a Roman villa were found here, with tessellated pavements, etc. Pop. (1891), municipal borough 4,021, parliamentary 10,147.

**DROITZSCHKA:** see **DROSKY**.

**DROLL**, a. *dröl* [F. *drôle*, a wag, a comical fellow: Dut. *drollig*, burlesque, odd: Low Ger. *draueln*, to speak in a childish manner: Icel. *troll*, a hobgoblin: Gael. *droll*, an idler; *drol*, a trick]: out of the common way; odd; laughable; merry; comical: N. a comical fellow; a jester; one who raises mirth or laughter: V. to jest; to play the merry-Andrew; to cheat. **DROL'LING**, imp. **DROLLED**, pp. *drôld*. **DROL'LERY**, n. *-lér-î*, sportive tricks; comical gestures or manners. **DROL'LINGLY**, ad. *-lî.* **DROL'LISH**, a. somewhat droll.—**SYN.** of 'droll, a.': comic; comical; ludicrous; ridiculous; farcial; diverting; arch; waggish; facetious; queer; amusing.

**DROMAIUS**, n. *drö-mä'ūs* [Gr. *dromaios*, running at full speed, swift]: in *ornith.*, a genus of *Struthionidæ*. *Dromaius Novæ Hollandiæ* is the Emu of New Holland: see **EMU**.

**DROME**, *dröm*: dept. of France, on the e. bank of the Rhone, s. of the dept. of Isere; 2,500 sq. m. In the w. of the dept., running from n. to s. along the Rhone, stretches a sandy plain of from five to eight m. in breadth; but toward the e. the surface is hilly; a spur of the Alps traversing the e. boundary, and sending offshoots of about 3,500 ft. in average height westward across almost the entire area of Drome. These heights, whose sides are covered with forests of pine, oak, and beech, afford excellent pasturage in summer and autumn. The general direction of the rivers of D. is w., toward the Rhone, and the most notable of them are the D., from which the dept. takes its name, and the Isere. Vines and mulberry, chestnut, walnut, and olive trees are extensively grown. about 8,600,000 gallons of wine are produced annually. Many of the vineyards are famous; probably the most celebrated is that of L'Hermitage, near Tain, on the banks of the Rhone, which yields red and white wines hardly surpassed in the world. D. has several iron-mines, also copper, lead, and to some extent coal. The manufactures are chiefly woolen cloth, silk, hosiery, serge, and cotton yarn. The dept. is traversed by the Lyon and Avignon railway. It is divided into the four arrondissements of Valence, Montélimart, Die, Nyons, with the town of Valence for capital. Pop. of D. (1901) 297,321.

**DROMEDARY**, n. *drüm'ë-dër-î* [F. *dromadaire*—from mid. L. *dromadarius*—from Gr. *drömas*, a running, swift]: name sometimes given, probably at first through mistake, to the Arabian or one-humped camel (*Camelus dromedarius*), but properly belonging to a variety of that species, distinguished by slenderness of limbs and symmetry of form, and by extraordinary fleetness. It has been well described as 'bearing much the same relation to the ordinary camel as



## DROMIA—DRONE.

a race-horse or hunter does to a cart-horse.' The pace of the D. is a trot, which it can maintain without intermission for a prodigious length of time; often at the rate of nine miles an hour for many hours together; while a journey of upward of 600 m. is performed at a somewhat slower rate in five days. Even its more rapid pace can be maintained for 24 hours at a stretch, without sign of weariness and without food; and if then it is allowed a little refreshment, of a ball of paste made of barley and powdered dates and a little water or camel's milk, it will resume its journey, and go on with undiminished speed for 24 hours more. The jolt



Dromedary.

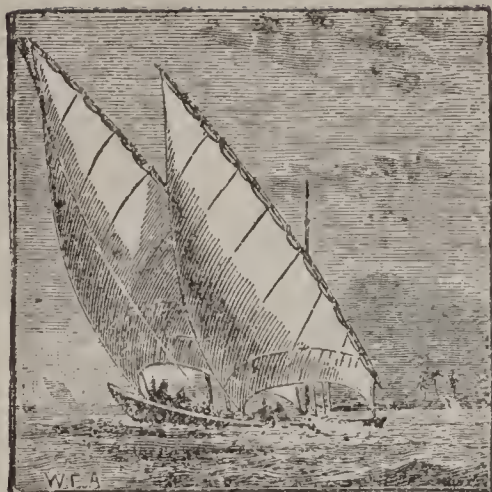
ing to the rider is terrible. The gallop is a pace unsuitable to the D., and at which it very soon fails. Dromedaries are sometimes trained to run races. White dromedaries are particularly prized in some parts of the East. See CAMEL.

**DROMIA**, n. *drō'mī-a* [Gr. *dromos*, running]: in *zool.*, the sponge-crabs, a genus of anomurous decapods. They are natives of warm seas. **DROMIDÆ**, n. *drōm-ī'z-dē*, family of anomurous crustaceans, of which *Dromia* is the type.

**DROMORE**, *drō'mōr* (*Druim Mor*, Great Ridge): episcopal city in the n.w. of the county of Down, Ireland, on the Lagan; 14 m. s.w. of Belfast. It has linen manufactures. In the peat-bogs here were found the remains of an elk, the space between the extremities of whose horns measured 10 ft. 3 inches. North of D. is a mound or rath, 60 ft. high, with three concentric intrenchments, and great outworks toward the Lagan. The see of D. was founded by St. Colman in the 6th c., but is now united with those of Down and Connor. Jeremy Taylor, when bishop here, built the present church. Pop. (1881) 2,491; (1891) 2,359.

**DRONE**, n. *drōn* [AS. *draen*, the non-working bee—from the buzzing sound it utters: Iccl. *drunr*, a loud hollow noise: Sw. *dronare*, one that makes a droning noise—from *drona*, to drone: Gael. *drannndan*, humming, buzzing]: the male of the honey-bee which makes no honey (see BEE): an idler; a sluggard; a dull humming sound; the large pipe of the bag-





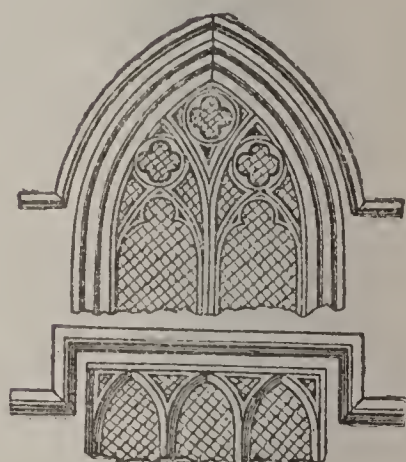
Droger.



Drosera.



Sundew (*Drosera rotundifolia*).



Drip-stones.



Drosky Used in St. Petersburg.

pipe, which sends forth a continuous, deep, unvaried sound; V. to emit a dull humming sound; to live idly. DRO'NING, imp. DRONED, pp. *drōnd*. DRO'NISH, a. -*nīsh*, idle; lazy. DRO'NISHLY, ad. -*lī*. DRO'NISHNESS, n. DRONE-PIPE, n. the largest of the three pipes of a bag-pipe; any instrument which emits a droning sound.

DRONTHEIM: see THRONDHJEM.

DROOP, v. *dróp* [Icel. *drúpa*, to droop; *dryp*, and *driupa*, to drip: comp. Gael. *drub*, an inclination to sleep]: to hang down; to lean forward or downward; to fail, sink, or decline; to languish from grief or other cause; to faint or grow weak. DROOPING, imp. DROOPED, pp. *drópt*. DROOP'INGLY, ad. -*lī*. DROOPING-TULIP, n., in *bot.*, *Fritillaria meleagris*, from the flower hanging downward, and much resembling a tulip in form.

DROORAJAPATAM', or DOOGOORAUZEPATAM': town on the Coromandel coast of Hindustan, with remarkable facilities for navigation, both maritime and inland. It stands on an inlet, which connects Blackwood Harbor with Pulicat Lake, the former being the only safe haven on the w. side of the Bay of Bengal, and the latter being artificially continued as far as Madras. The place is 60 m. n. of Madras, and 34 s. of Nellore; lat. 13° 59' n., and long. 80° 13' east.

DROP, n. *dröp* [Dut. *drop*; Sw. *droppe*; Ger. *tropfen*; Icel. *dropi*, a drop: Icel. *driupa*, to drip]: a small portion of a fluid; a very small quantity; a globule of a liquid; anything in the supposed form of a globule of water, as an ornament; part of a gallows on which the criminal stands; V. to pour or let fall a liquid in small portions; to let fall *anything*; to dismiss or lay aside, as to drop a subject; to utter slightly or briefly, as to drop a hint; to sink or lower; to fail; to come to an end; to have done with, as to drop an acquaintance; to visit unexpectedly, as to drop in. DROP'PING, imp.: N. a distilling; a falling; that which drops or falls. DROP'PINGS, n. plu. the excrement or dung of animals. DROPPED, pp. *dröpt*. DROPPER, n. in *agri.*, one form of a reaping machine in which the grain falls upon a slotted platform, which is dropped occasionally to deposit the gavel upon the ground. Simultaneously with the bringing into action of the dropper, a cut-off is brought down to arrest the falling grain till the platform is reinstated; in *min.*, a divaricating vein, which leaves the main lode; or a lode which assumes a vertical direction. DROP'LET, n. *lēt*, a little drop. DROP'PINGLY, ad. -*lī*. DROPS, n. plu. a medicine, the dose of which is measured by drops; certain flattened circular sweetmeats. DROP-BOX, n. in *weav.*, a shuttle-box used in figure-weaving looms in which each shuttle carries its own color. DROP-FLUE BOILER, a boiler in which the caloric current descends by one or more steps or gradations, bringing it into contact with parts of the boiler in descending series; the object being to cause it to leave the boiler at the lower part, where the feed-water is introduced. DROP-HAMMER, n. a hammer in which the weight is raised by a strap or similar device, and then released so as to drop upon the object below, which rests upon



## DROPSY—DROSERA.

the anvil. It is used in swaging, die-work, striking up sheet-metal, jewelry, etc. DROP-KICK, n. in *foot-ball*, a mode of kicking the ball by letting it fall from the hands, and kicking it as it begins to rebound from the ground. DROP-METER, n. an instrument for measuring out liquid drop by drop. Sometimes called a dropping-bottle, dropping-tube, burette, pipette. DROP-PRESS: same as DROP-HAMMER (q.v.). DROP-ROLLER, n. in *print.*, a roller dropping at intervals to draw in a sheet of paper to the press. DROP-SEED, n. in *bot.*, a plant, *Muhlenbergia diffusa*, or American grass. DROP-TABLE, n. a machine for lowering or raising weights, as in the hatchways and cellar-ways of city warehouses; a machine for withdrawing carriage and locomotive wheels from their axles. To DROP ASTERN, in *sailors' language*, to slacken the speed of a vessel to allow another to pass her. To DROP DOWN, to sail or move down a river. DROP-SCENE, in a *theatre*, a painted curtain suspended by pulleys, and which is made to fall down in front of the stage between the scenes or acts.—SYN. of 'drop, v.': to sink; tumble; distil; cease; discontinue; suggest; lower; send; variegate; speckle; die.

DROPSY, n. *drōp-sī* [OF. *hydropisie*, the dropsy: L. *hydropīsis*; Gr. *hudrōps*, the dropsy—from Gr. *hudōr*, water—the word having been formerly written *hydropisy*]: unnatural collection of water or lymph in any part of the body. DROP'SICAL, a. *-sī-kāl*, inclined to dropsy. DROPSICALNESS, n. the quality or state of being dropsical. DROP-SIED, a. *-sīd*, having dropsy.—D. belongs to a class of diseases always of serious import, though not often directly fatal. It is indeed rather a symptom than a disease; it consists of the effusion of watery fluid from the blood into the skin and subjacent textures, or into the cavities of the body. When the effusion is chiefly in the superficial parts, the D. is called anasarca [*ana*, upon; *sarx*, the flesh]; when in the abdomen, it is termed ascites; when in the chest, hydrothorax. D. most usually depends on disease of the heart (q.v.) or kidneys (q.v.); in cases of ascites, the liver and spleen are often at fault. The treatment of D. is chiefly by diuretics (q.v.), and other evacuant remedies, which remove the fluid from the textures by unloading the blood of its excess of serum. It is, however, difficult to find the proper remedy in each individual case. In all cases of D., the internal organs should be, if possible, submitted to a strict medical examination, and the treatment regulated accordingly. DROPSY, in *bot.*, a disease in plants caused by an excess of water.

DROSERA, n. plu. *drōs'ēr-ă* [Gr. *dorsēros*, dewy—from *drosos*, dew]: genus of herbaceous plants, ord. *Droserācēæ*. DROSERA'CEÆ, nat. ord. of exogenous plants, consisting entirely of herbaceous plants, which generally inhabit marshy places, and are often covered with glands. All the leaves are frequently radical, and they and the flower-stalks are rolled up in bud like the fronds of ferns. There are five sepals, five petals, five, ten, fifteen, or twenty stamens: the fruit is a one-celled capsule, with numerous seeds



## DROSKY—DROUET.

About 100 species are known, distributed over most parts of the world, many of them plants of very delicate appearance; and many of them, as the species of *Drosera* or SUN-DEW, natives of Britain, are remarkable for their glandular hairs, which secrete a viscid fluid, and by means of it often fatally detain flies which alight on them—the leaves folding together over the insects. *Rosidula dentatā* is placed in houses in s. Africa on this account. Venus's Fly Trap belongs to this order. See DIONÆA. Acrid and stimulant properties prevail in the Droseraceæ.

**DROSKY**, and **DROSCHKY**, n. *drös'kǎ* [Russ. *drozhki*]: a four-wheeled open carriage used by the Russians—many kinds of vehicles are now so called. **DROS'KIES**, n. plu. *-kiz*.

**DROSOMETER**, n. *drös-öm'ě-tēr* [Gr. *drosos*, dew; *mētron*, a measure]: apparatus or instrument for determining the amount of dew deposited during a single night; it is merely a balance delicately poised, one scale open to the dew, the other protected from it; and the amount of dew on the wet scale is indicated by weights placed on the other.

**DROSS**, n. *drös* [AS. *dros*; Dut. *droes*, dregs, filth: OF. *drasche*, lees; *dresche*, crushed barley]: worthless matter separated from the better part; any waste or refuse; the scum or refuse of metals thrown off in melting; impurity; small broken coals. **DROSS'LESS**, a. pure. **DROS'SY**, a. *-sǎ*, full of dross; impure; foul. **DROS'SINESS**, n. *-nēs*, foulness; impurity.—**SYN.** of 'dross': scum; impurities; lees; dregs; excrement; incrustation; rust; waste; refuse.

**DROSTE-HÜLSHOFF**, *drös'téh hūls'hof*, **ANNETTE ELIZABETH**: 1793, Jan. 12—1848, May 24; b. on the estate of Hülshoff, near Münster: German lyric poetess. Of delicate constitution, and living in complete seclusion from the world, she nevertheless received an excellent scientific education. In 1825 she was introduced into a wider circle of distinguished men and women at Cologne and Bonn, but in a short time retired again to her maternal estate of Rischhaus, near Münster, where she lived almost exclusively for science, nature, and poetry. She died near Lake Constance. Though distinguished among literary women of the time, she retained all the timidity of her sex, avoiding the eccentricities of many women who think they have a mission to regenerate society. Her *Gedichte* (Poems) appeared at Stuttgart 1844, and of her posthumous works *Das geistliche Jahr nebst einem Anhang religiöser Gedichte* at Stuttgart 1852. The poems are not only perfect as regards form, but also show a remarkable union of womanly gentleness and poetical creative power.

**DROUET**, *drô-ā'* **JEAN BAPTISTE**, Comte d'ERLON: French marshal: 1765, Jul. 25—1844, Jan. 25; b. Rheims. he entered a regt. of volunteers 1792, and took part 1793–96 in the campaigns of the Moselle, Meuse, and Sambre. His important service quickly obtained him promotion. His conduct in the peninsular war was highly distinguished, and elicited the warmest eulogiums from Massena. After the fall of Napoleon, the Bourbons tried to secure his ser-

## DROUGHT—DROVE.

vices, and gave him the command of the 16th division, but he was shortly afterward arrested on the charge of conspiring against the royal family. Managing to escape, he remained in concealment in Lille until the return of Napoleon from Elba, when, putting himself at the head of the troops he seized the citadel and held it for the emperor, who made him a peer of France. At the battle of Waterloo he commanded the first *corps d'armée*. After the capitulation of Paris, he fled to Bavaria, where he resided until the July revolution, when he returned to France, and received, 1832, the command of the army of Vendée. During 1834-5, he held the important office of gov. gen. of Algeria, and in 1843 was elevated to the rank of marshal.

**DROUGHT**, n. *drowt* [AS. *druguth*; Dut. *drooghte*; Scot. *drouth*—from AS. *dryg*; Dut. *droogh*, dry]: dry weather; want of rain; thirst. **DROUGHTY**, a. *drow'ti*, wanting rain; thirsty. **DROUGH'TINESS**, n. *-nēs*, state of dryness of the weather. **DROUTH**, n. *drowth*, dry weather; thirst; another spelling of **DROUGHT**. **DROU'THY**, a. *-thŭ*, thirsty. **DROU'THINESS**, n.

**DROUYN DE LHUYS**, *drô-äng' deh lwè'*, **EDOUARD**: 1805, Nov. 19—1881, Mar. 1; b. Paris: French diplomatist and politician. He studied at the college of Louis-le-Grand and the École de Droit. He was at first attached to the embassy at Madrid, whither he went 1830. In 1840 he was placed at the head of the commercial dept. under the minister of foreign affairs, and shortly afterward was elected *député* for Melun; but taking a part hostile to the government, of which he was a subordinate member, he was deprived of his situation by Guizot. This gave him fuller scope for the advocacy of his political opinions. He now became an active member of the *Reforme* party, and after the famous banquet of the 12th arrondissement had been interdicted, he signed with the other chiefs of the opposition, the accusation drawn up against Guizot and his colleagues. Elected representative of the people to the constituent and legislative assemblies, by the dept. of Seine-et-Marne, he was made first a member and then pres. of the committee of foreign affairs. Here he acted generally with the moderate party. In the first cabinet formed by Louis Napoleon after his election to the presidency, 1848, Dec. D. became minister of foreign affairs, and directed the French policy in all the difficult European complications of the year. In 1849 he went to London for a short time as ambassador, and after the *coup d'état* became one of the vice-presidents of the imperial senate, and again minister of foreign affairs. Being disappointed at the issue of the Vienna Conferences in 1855, he resigned his office. In 1863 he was recalled to his old post, resigning again 1866. In 1871, he fled to Jersey.

**DROVE**, v. *drōv*: past tense of **DRIVE**, which see.

**DROVE**, n. *drōv* [from *drive*: AS. *drifan*, to urge forward]: a number of animals, as sheep or cattle, moving in a body; a crowd of people in motion; in *agri.*, a narrow channel or drain used for the irrigation of land; in



## DROWN.

*masonry*, a broad-edged chisel used by stone-masons; a mode of parallel tooling by perpendicular fluting on the face of hard stones. **DROVED**, a. in *masonry*, tooled. **DROVER**, n. *drō'vēr*, one who drives cattle and sheep to market. **DROVING**, n. in *masonry*, the same as tooling. **DROVED ASHLAR**, in *masonry*, chiselled or random-tooled ashlar, an inferior kind of hewn work used in building. **DROVED AND BROACHED**, in *masonry*, a term applied to work that has been first rough-hewn and then tooled clean.

**DROWN**, v. *drown* [Icel. *dreckia*, to sink under water: Dan. *drukne*, to drown (see **DRINK**)]: to overwhelm in water; to destroy life by submersion in water; to immerse; to overflow; to inundate; to perish in water; to put an end to, as to drown care. **DROWN'ING**, imp.: **ADJ.** perishing in water (see **ASPHYXIA**): **N.** the act of destroying life by immersion in water. **DROWNED**, pp. *drownd*.—*Drowning*, as a mode of capital punishment, has only lately ceased in Europe, and is probably still in use in some other quarters of the world. Tacitus, about the end of the 1st c., tells us that the Germans hanged their criminals of higher grade, but that meaner and more infamous offenders were plunged under hurdles into bogs and fens. By the law of the ancient Burgundians, a faithless wife was to be smothered in mud. The Anglo-Saxon codes ordered women convicted of theft to be drowned. The punishment was in such common use throughout the middle ages, that grants of capital jurisdiction ran *cum fossa et furca*, i.e., 'with pit and gallows.' The pit, ditch, or well, was for drowning women; but the punishment was inflicted occasionally on men. The doom of the parricide was to be put into a sack and cast into the sea. John of Nepomuk q.v., afterward enrolled in the catalogue of saints, was drowned 1393, for refusing to reveal the secrets of the confessional. In this instance, perhaps, drowning was a mode allowed to the offender as a matter of favor. So in Scotland, 1556, a man convicted of theft and sacrilege, was sentenced to be drowned, 'by the queen's special grace.' So lately as 1611, a man was drowned at Edinburgh for stealing a lamb. By that time, the punishment of drowning had become obsolete in England. It survived in Scotland until 1685. The last execution by drowning in Switzerland was in 1652, in Austria in 1776, in Iceland in 1777. **DROWNED-LEVEL**, n. in *min.*, a depressed level or drainage gallery in a mine, which acts on the principle of an inverted siphon; a blind-level. **DROWNING-BRIDGE**, n. a sluice-gate for overflowing meadows.

**DROWN, THOMAS MESSINGER**, M.D., LL.D.: educator; 1842, Mar. 19 — — — — —; b. in Philadelphia, Pa. He graduated at the Philadelphia High School, and later (1862) at the Univ. of Penn. with the degree M.D. He took graduate studies in chemistry at Yale and Harvard, afterward in Europe, at Freiburg, Heidelberg, and Paris, till 1868. He practiced as analytical chemist in Philadelphia; became prof. of analytic chemistry in Lafayette College 1874, and in Mass. Institute of technology 1881. In 1895,



## DROWSE—DRUGGET.

he was made LL.D. of Columbia College, and became pres. of Lehigh Univ., Penn.

**DROWSE**, or **DROWZE**, *drowz*: see under **DROWSY**.

**DROWSY**, a. *drow'zī* [Dut. *droosen*, to doze, to slumber. Dan. *drose*, to dawdle. Low Ger. *drusseln*, and *drösseken*, to slumber]: inclined to sleep; sleepy; dull; sluggish. **DROW'SINESS**, n. *-nēs*, heaviness or disposition to sleep. **DROW'SILY**, ad. *-lī*. **DROW'SY-HEADED**, having a sluggish disposition. **DROWSE**, v. *drowz*, to slumber; to grow heavy with sleep. **DROWSE**, or **DROWZE**, n. heavy sleep; slumber. **DROW'SING**, imp. **DROWSED**, pp. *drowzd*: **ADJ** looking heavy or sleepy.—**SYN.** of 'drowsy': heavy; dozing; lethargic; comatose; stupid.

**DROYLSDEN**, *droylz'den*: large and increasing township in Lancashire, England; a district parish of Manchester, 4 m. e. from Manchester; station on the Lancashire and Yorkshire railway. It is on an elevated plain, is irregularly built, the houses of brick, but many of them very neat. The cotton manufacture is extensively carried on; there are also print-fields, dye-works, and copperas-works. Pop. (1871) 6,768; (1881) 8,679; (1891) 9,482.

**DRUB**, v. *drūb* [Icel. *drepa*, to strike: Sw. *drabba*, to hit or knock]: to thrash; to beat with a stick; to beat soundly. **DRUB'ING**, imp.: N. a sound beating. **DRUBBED**, pp. *drūbd*.

**DRUDGE**, v. *drūj* [AS. *dreogan*, to work: Gael. *dreuchd*, to labor in low offices: Ir. *drugaire*, a slave or drudge]: to work hard; to labor in mean offices: N. one who labors with toil and fatigue; one employed in mean labor. **DRUDG'ING**, imp. **DRUDGED**, pp. *drūjd*. **DRUDG'ER**, n. a laborer in menial or mean offices; a slave; a drudge. **DRUDG'ERY**, n. *-ēr-ī*, hard and continuous labor; ignoble toil. **DRUDG'INGLY**, ad. *-lī*.

**DRUG**, n. *drūg* [F. *drogue*, a drug: Dut. *droog* and *droogh*, dry, from their hot dry nature as once used: It. *treggea*; Sp. *dragea*, sweetmeats—articles of that nature having formerly constituted the principal stock of a druggist]: any medicinal substance, or material agent used in the treatment of disease, when in crude or commercial form; any article slow of sale, or not saleable: V. to dose to excess with medicine; to season or tincture with something offensive or injurious. **DRUG'ING**, imp. dosing with drugs. **DRUGGED**, pp. *drūgd*. **DRUG'GIST**, n. *-gīst*, one who deals in drugs: see **APOTHECARIES: CHEMISTS AND DRUGGISTS: PRESCRIPTION**.

**DRUGGET**, n. *drūg'gēt* [F. *droguet*, a kind of stuff of wool, etc.—from *drogue*, a stuff, trash]: common felt or other coarse woolen fabric, used chiefly for covering carpets, or as a substitute for a carpet. Formerly it was used largely as an article of clothing by the humbler classes, and even yet the *drugget petticoat* is worn, though it is gradually giving place to cotton fabrics, which have the advantage of greater cleanliness, and of less liability to retain infectious and contagious poisons.

## DRUID.

**DRUID**, n. *dró'id* [Gael. *drud*, an inclosure; *druid*, to inclose, to surround; *druidh*, one admitted within the inclosure, a priest, a sorcerer, a druid: W. *derwydd*, a druid: L. *druīdēs*, the priests and wise men of the Britons and Gauls]: one of the ministers or priests among the anc. Celts, Gauls, or Britons, who are said to have esteemed the oak sacred, and sacrificed under it. **DRUIDISM**, n. *-izm*, the doctrines, rites, etc., of the Druids. **DRUIDICAL**, a. *-i-kāl*, pertaining to the Druids. **DRUIDESS**, n. a female Druid. **DRUID STONES**, a name given in the s. of England, and other parts of the country, to those weather-worn, rough pillars of gray sandstone which are scattered over the surface of the chalk downs in England, in Scotland, and its islands, and which exist in great numbers in other countries, generally in the form of circles, or in detached pillars: it is not certain, however, that the Druids had any connection with these stones.—*Druidism*, is commonly spoken of as the religious system of the Gauls and Britons, or of the Celtic peoples. Prof. Rhys, however, in his work on *Celtic Britain* (1882), affirms that the real religion of the Celts was an Aryan Polytheism like that of Italians and Greeks; and that Druidism, so far as found among the Celts of Gaul or Britain, was by them derived from pre-Celtic and non-Aryan aborigines (Ivernians, Iberians, Euskarians, Neo-lithic men?). and was thus non-Aryan in origin. There is no reason, Rhys says, for holding that D. was found among the Brythonic or Kymric races proper, though it was in force among the originally Goidelic (Gaelic) people of Wales. Cæsar thus describes the character and functions of the Druids: 'They attend to divine worship, perform public and private sacrifices, and expound matters of religion. A great number of youths are gathered round them for the sake of education, and they enjoy the highest honor in that nation; for nearly all public and private quarrels come under their jurisdiction; and when any crime has been committed, when a murder has been perpetrated, when a controversy arises about a legacy, or about landmarks, they are the judges too. They fix rewards and punishments; and should any one, whether a private individual or a public man, disobey their decrees, then they exclude him from the sacrifices. This is with them the severest punishment. The persons who are thus laid under interdict are regarded as impious and wicked people; everybody recoils from them, and shuns their society and conversation, lest he should be injured by associating with them. They cannot obtain legal redress when they ask for it, nor are they admitted to any honorable office. All these Druids have one chief, who enjoys the highest authority among them. When he dies, he is succeeded by the member of the order who is most prominent among the others, if there be any such single individual; if, however, there are several men equally distinguished, the successor is elected by the Druids. Sometimes they even go to war about this supremacy. At a certain time of the year, the Druids assemble on the territory of the Carnutes, which is believed to be the centre of all Gaul, in a sacred



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place. To that spot are gathered from everywhere all persons that have quarrels, and they abide by their judgments and decrees. It is believed that this institution was invented in Britannia, and thence transplanted into Gaul. Even now-a-days, those who wish to become more intimately acquainted with the institution, generally go to Britannia for instruction's sake.

'The Druids take no part in warfare; nor do they pay taxes like the rest of the people; they are exempt from military service, and from all public burdens. Attracted by such rewards, many come to be instructed by their own choice, while others are sent by their parents. They are reported to learn in the school a great number of verses, so that some remain there twenty years. They think it an unhallowed thing to commit their lore to writing, though in the other public and private affairs of life they frequently make use of the Greek alphabet. . . . Beyond all things, they are desirous to inspire a belief that men's souls do not perish, but transmigrate after death from one individual to another; and they hold that people are thereby most strongly urged to bravery, as the fear of death is thus destroyed. Besides, they hold a great many discourses about the stars and their motion, about the size of the world and of various countries, about the nature of things, about the power and might of the immortal gods; and they instruct the youths in these subjects.'

It is easy to comprehend that this powerful priesthood did all that they could to uphold the national cause against the Roman conquerors, and urged the people to resistance; so much so, that the Emperor Claudius found it necessary to interdict formally the practicing of Druidical rites, which seem, however, to have continued till the extinction of paganism. Besides being priests and teachers of religion, the Druids appear to have been also adepts in the magic arts, and were versed in the mysterious powers of animals and plants. The oak-tree is usually believed to have been especially sacred among the Druids. In oak-groves, they frequently performed their rites, and it has been supposed that they even derived their name from this custom. See CELTIC NATIONS. The Druids seem, however, to have performed their rites under any kind of trees; and some recent investigators deny the long-asserted origin of the name Druid from Gr. *drus*, an oak-tree. The Druids had a special reverence for the mistletoe, when growing on an oak. According to Pliny, a Druid, clothed in white, mounted the tree, and with a knife of gold, cut the mistletoe, which was received by another, standing on the ground, in his white robe. The same author gives a curious account of the 'serpent's egg,' worn as a distinguishing badge by the Druids. It was formed, he says, by the poisonous spittle of a great many serpents twined together. Gathered at moonlight, and afterward worn in the bosom, it was a mighty talisman. All these particulars refer properly to the Druids of Gaul, but Cæsar's testimony leaves no doubt that the Druidism of Britain was essentially the same.

In all the countries anciently inhabited by Celts, there



## DRUIDS.

are found rude structures of stone, one of the most common forms of which is the so-called *dolmen* (see DOLMEN). The older archæologists assumed that these were Druidical altars, but there is no proof that such was their destination or origin: similar structures are found in Scandinavia and many parts of Germany, and to assume in all these countries the presence of Celts, seems extreme. The same doubts prevail as to the larger monuments of this kind—the supposed Druidical temples of Amesbury, of Carnac in Brittany, and of Stonehenge (q.v.).

DRUIDS, ORDER OF: secret societies that have sprung from a club organized in London 1781, solely for the entertainment of its members. The popularity of the club soon led to the formation of others, and in time they were constituted a distinct order and provided with a ritual for initiations and a form of govt. founded upon traditions said to have been preserved from the ancient Druids. With the extension of the order many benevolent features were instituted. Differences of opinion among prominent members resulted in the division of the original order into several independent bodies. These are now reduced to two, the *Ancient Order of Druids* and the *Order of Druids of England*, to which all the 'groves' in Great Britain are subordinate. A 'grove,' chartered by the latter supreme body, was instituted in New York 1833, and was the parent of the order in the United States. The order rapidly extended through the country, and from the past officers a supreme body was organized under the title of the *Grand Grove of the United States of the United Ancient Order of the Druids*, which declared its independence of the English supreme grove, made an entire change in the ritual, and introduced a number of new degrees. As now constituted the order in its benevolent features resembles *American Odd Fellowship* and some of the later orders, such as the *American Legion of Honor*, *Knights of Honor*, *Order of Chosen Friends*, and *Royal Arcanum*, that were founded expressly to conduct a life insurance business. In 1894 the order in the United States reported 15 grand groves; 378 subordinate groves; 14,700 members; and \$3,231,580 expended in benevolence since 1849.

## DRUM.

DRUM, *n.* *drum* [imitative of the sound: Icel. *thruma*, thunder: Dan. *drum*, a booming sound: Dut. *trom*, a drum; Ger. *trommel*; Fr. *tambour*—modification of *tabour*; *timbrel* and *tambourine* are other forms of the word *tabour* or *tambour*]: a musical instrument, hollow, cylindrical, and flat at the two ends, one or both of which are covered with parchment or vellum, on which the drummer beats with an instrument of wood or metal called a drumstick; in a *machine*, a short cylinder moving on an axis, on which are the straps which move the several wheels; anything resembling a drum in form; in *arch.*, the bell-formed part of the Corinthian and Composite capitals; in *com.*, a small cylindrical box for holding fruit; a keg with straight sides; in *paper-making*, a washing drum for cleansing rags; in *calico-print.*, one name of the cask in which steam is applied to printed fabrics in order to fix the colors: *V.* to beat or play on a drum. DRUMMING, *imp.* DRUMMED, *pp.* *drumd.* DRUMMER, *n.* one who; in the U. S. army every infantry company has one drummer and one fifer. The drummer is slightly superior in position to the privates, yet ranks as one of them. Beside his ordinary duties at drills and parade (see BEAT OF DRUM) he attends to the wounded on the battle-field. Drummers are often young, scarcely more than boys. All the drummers and fifers of a regt. form the *Drum-corps*. DRUMMER, in the *United States*, one who solicits for custom. DRUM OF THE EAR, the tympanum or internal membrane of the ear which conveys the impression of sound. DRUM-HEAD, the parchment or skin stretched over each end of a drum; *naut.*, the head of the capstan, having square holes to receive the bars. DRUM-HEAD COURT-MARTIAL, a summary court summoned in haste around the big drum to try offenses committed in the field. DRUM-MAJOR, first or chief drummer in a regiment; little known in the English army till the time of Charles I., though there was in earlier times an officer in the royal household called the *drum-major-general*. In the U. S. army the drum-major is leader of the regimental drum-corps, instructing them, transmitting to them the orders for signals, and directing them on parade. His rank is sergeant, and he is attached to the non-commissioned staff. DRUM-SAW, *n.* a cylindrical saw for sawing curved stuff, staves especially; a cylinder-saw; a barrel-saw. DRUMSTICK, *n.* a stick with which a drum is beaten, or anything resembling it. DRUM-WHEEL, *n.* a very ancient oriental form of water-raising wheel which was originally drum-shaped, but afterward had scoop-shaped buckets, which dipped up water and conducted it toward the axis, at or near which it was discharged. To DRUM OUT, to expel ignominiously from the army (see DISCHARGE.) To DRUM UP, to assemble, as by beat of drum. —The drum as an instrument of music is used with other instruments in bands, particularly for military purposes. The military drum serves for giving various signals as well as for music. There are three kinds of drum—the *side* drum, the *big* or *base* drum, and the *kettle* drum. The last is the cavalry drum, a copper or brass hemisphere, resembling a

## DRUM.

*kettle*, with a parchment lid. The big or base drum has both ends covered with parchment. The smaller or side drum is called sometimes a *snare-drum*, having cat-gut strings stretched tightly across its lower head to add to the resonance. The SACRED DRUM was an object of religious veneration and an instrument of magical incantation among the Laplanders in former times. It was hollowed out of a piece of the trunk of a pine or birch, in which certain peculiarities were required, and was covered with skin on the upper side only, the wood being partly left on the under side to serve as a handle. Figures were painted in red on the skin; the drumstick was a reindeer's horn; and to the drum were appended a large copper ring and some smaller rings. The drum was considered a necessary part of the furniture of every family. The motions of the rings, when the drum was beaten, which might be done only by the head of the family, were supposed to afford indications concerning the results of disease and other future events. The beating of the drum was accompanied with songs, and the person by whom it was beaten often fell into a trance, during which revelations were supposed to be made to him. The sacred drum seems to have been in some way connected with the worship of the sun. The ancient Romans used small hand-drums—some resembling tambourines, others kettle-drums—in their religious dances; and the Parthians are said to have used them in war to give signals. They are believed to have been first brought into w. Europe by the Crusaders. TOM (or JOHN) DRUM'S ENTERTAINMENT, a proverbial expression for ill-treatment, probably alluding originally to some particular anecdote. The allusions seem to point to the dismissing of some unwelcome guest, with more or less ignominy and insult.

DRUM (*druim*): Celtic word meaning the back, and applied to a ridge of hills; it enters into the composition of many names of places, especially in Ireland, as Drumcondra, Drumglass, Drumsheugh.

DRUM: colloquial term for a fashionable and crowded evening-party about the middle of the 18th c., at which card-playing appears to have been the chief attraction. The names drum, rout, and hurricane, by which these gay assemblies were known, sufficiently indicate their noisy, promiscuous character. Lady Mary Wortley Montagu, writing from Louvère to her daughter in 1753, hints that ladies gave these entertainments to make money at cards to support their extravagance; and adds: 'I find I should be as solitary in London as I am here, it being impossible to live in a *drum*, which, I think so far from a cure of uneasiness, that it is, in my opinion, adding one more to the heap.' See ROUT.

DRUM, *drūm*, RICHARD COULTER, U. S. A.: b. Westmoreland co., Penn., 1825, May 28: adj.gen. He was educated at the co. acad. and at Jefferson College; enlisted as a private in co. K, 1st. Penn. vols., 1846, Dec. 8, served with his regt. in the Mexican war, and was engaged in the



## DRUMBLE—DRUMMOND.

siege of Vera Cruz; was appointed 2d. lieut. U. S. inf. 1847, Feb. 18, assigned to the 9th inf. Apr. 9, joined his regt. May 19, and served with it till 1848, July, taking part in the battles of Contreras, Churubusco, Molino del Rey, Chapultepec, and Garita de Belen; was brevetted 1st lieut. for gallant conduct at Chapultepec 1847, Sep. 13; transferred to the 4th artil. 1848, Mar. 8, and promoted 1st lieut. 1850, Sep. 16. He then served in the south and west; and was appointed aide-de-camp to Gen. P. F. Smith, commanding dept. of the west, 1858, May. After serving as adj. of the artil. school at Fortress Monroe, he was appointed brev.capt. and assist.adj.gen. 1861, Mar. 16; promoted maj. and assist.adj.gen. 1861, Aug. 3; lieut.col. 1862, July 17, and col. 1869, Feb. 22; was assist. adj.gen. at the headquarters of the dept. of the Pacific, San Francisco, 1861, May—1866, Oct. 1; and in the same capacity at the headquarters of various depts. and divisions till 1878, May, when he was assigned to duty in the adj.gen.'s office, Washington. He was appointed brig.gen. and adj.-gen. of the army 1880, June 15, and was retired 1889, May 28.

DRUMBLE, *v.* *drŭm'bl* [Gael. *trom*, heavy, dejected; *trom-liche*, a weight on the heart or spirits]: in *OE.*, to make muddy; to be sluggish; to be heavy; to go about the doing of a thing in a confused, heavy manner. DRUMBLING, *imp.* *drŭm'bling*. DRUMBLED, *pp.* *drŭm'bld*. DRUMLY, *a.* *drŭm'lı*, or DRUMBLY, *a.* *drŭm'blı*, in *Scot.*, foul; muddy, as water; troubled.

DRUM-FISH: see *POGONIAL*.

DRUMMER, *n.*: *Blatta gigantea*, the largest of all the species of *Blattidæ*, or cockroaches. It measures about three inches in length. It is an inhabitant of S. America and the W. Indies, and obtains its name from its habit of producing a noise with its head resembling a sharp knocking with the knuckles against wainscoting. It is said sometimes to devour the extremities of the dead, and even to attack people when asleep. It is a handsome insect, being of a pale yellow color.

DRUMMOND, *drŭm'ond*, Sir GEORGE GORDON: 1771-1854, Oct. 10; b. Quebec: soldier. He entered the British army as ensign 1789; became lieut.col. 1794; served with distinction in the Holland campaign 1794-5, and in Egypt 1800; was staff-officer at Jamaica several years; on duty in Canada 1808-11; promoted lieut.gen. 1811; again ordered to Canada as second in command under Sir George Prevost 1813; planned and effected the capture of Fort Niagara, and planned the successful attack on Black Rock and Buffalo; led a combined military and naval force against Oswego and destroyed the American works and stores 1814, May; was in command of the British forces at the battle of Lundy's Lane July 25; and invested but failed to capture Fort Erie, Aug. In 1815 he was appointed gov.gen. of Canada, resigned and returned to England, and 1817 received the grand cross of the order of the Bath.

## DRUMMOND.

**DRUMMOND, HENRY:** b. Scotland, 1851: scientist. He was educated at a school in Stirling and at Edinburgh Univ., and after taking a special course at Tübingen Univ. applied himself to the study of natural science, and was appointed lecturer on the subject in Free Church College, Glasgow, 1877, and subsequently professor. Prior to this he had become conspicuous in religious circles of Scotland by an address before the theol. soc. of New College on *Spiritual Diagnosis*, 1873, in which he contended that an indispensable part of a successful minister's work was individual dealing with souls, that in a few minutes' conversation with a young man the discovery might be made of his individual need, and the proper teaching applied. The same year Messrs. Moody and Sankey made his acquaintance, were impressed with his religious fervor, and induced him to accompany them on their evangelistic tour. For several years it was his privilege to address regularly two very different audiences on two very different themes. On week days he lectured to a class of students on the natural sciences, and on Sundays to an audience consisting for the most part of workingmen, on subjects of a moral and religious character. For a time he succeeded in keeping science and religion separate, but gradually the subject-matter religion took on the method of expression of science, and he found himself enunciating spiritual laws in the exact terms of biology and physics. These addresses he published under the title of *Natural Law in the Spiritual World* (1883). He has since lectured in the United States, and published *Pax Vobiscum*, and *The Greatest Thing in the World* (1890); *Tropical Africa* and *The Programme of Christianity* (1891); *The City Without a Church* (1893); and *The Ascent of Man*, Lowell lectures on *Evolution* (1894). He d. 1897, Mar. 11.

**DRUMMOND, Captain THOMAS, R.E.:** 1797-1840, Apr. 15; b. Edinburgh. During his professional training at Woolwich and Chatham he showed high mathematical and mechanical abilities, with aptitude for the practical application of scientific principles. In 1820, he was an assistant in the trigonometrical survey of the United Kingdom. The incandescence of lime having been brought under his notice at a lecture on chemistry, he made experiments, with a view to its application for light on distant objects in the survey, and the result was the Drummond light: see **DRUMMOND LIGHT**: also *Philosophical Transactions*, 1826. He invented a heliostat or reflecting mirror, described in the same paper. Experiments for adapting his *Light* to light-houses, are detailed in the *Philosophical Transactions*, 1830. His attention being diverted to political life, he filled some minor offices, and, 1835, went to Dublin with Lord Mulgrave, as under-sec. for Ireland. Here he at once gained the confidence and affection of the people. In a letter written by him to the magistrates of Tipperary 1838, May 22, he used the words—'Property has its duties as well as its rights;' an aphorism which instantly flew over Ireland. He was the head of a commission appointed 1836 to report on a railway system for Ireland—a laborious and valuable



## DRUMMOND—DRUMMOND LIGHT.

service. His labors overtasked his strength, and he died, lamented by the Irish people. A statue by Hogan was erected to his memory by public subscription, in the Royal Exchange at Dublin; and a memoir of his professional life (abridged in Knight's *English Cyclopædia of Biography*, II. 647) was published 1841 by Captain Larcom, R.E., in vol. IV. of *Papers on Subjects Connected with the Duties of the Corps of Royal Engineers*.

DRUMMOND, WILLIAM, OF HAWTHORNDEN: poet: 1585, Dec. 13—1649, Dec. 4; descended from a very ancient and noble Scottish family. He was educated at the High School of Edinburgh, and at the Univ. of Edinburgh, where he took his degree M.A., 1605, July 27. On leaving college, he was sent to the continent in order to study law. He returned 1609, and at the death of his father in the following year, he retired to the paternal estate at Hawthornden, which, according to the learned Ruddiman, 'was a sweet and solitary seat, and very fit and proper for the muses;' and there, with an interval of eight years of foreign travel, spent his life in his favorite literary pursuits. His death, it is said, was hastened by his excessive grief for the fate of Charles I. His principal works are the following: *Tears on the Death of Mæliades*—Prince Henry, son of James I.—(Edin. 1613); *Poems: Amorous, Funerall, Divine, Pastorall, in Sonnets, Songs, Sextains, Madrigals* (1616); *Forth Feasting* (1617); *Flowers of Zion* (Oxford 1623). After relinquishing poetry, he wrote a sectional History of Scotland, known as the *History of the Five Jameses*. A standard edition of his poems was edited for the Maitland Club by Dr. Irving and Lord Dundrennan 1832. Smaller editions appeared 1833 and '56, and an exhaustive Life, with an account of his writings, by Prof. Masson, 1873. D.'s *Notes of Ben Jonson's Conversations with William Drummond of Hawthornden*, is a characteristic record of the literary spirit of the time. See D.'s *Life* by Prof. Masson.

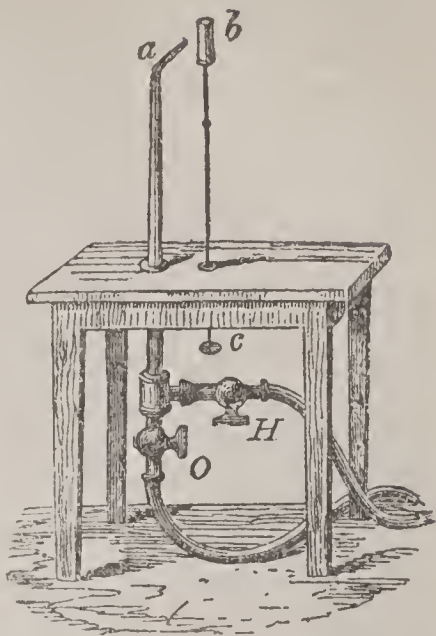
D.'s verse abounds in the conceits, antitheses, and hyperboles of the period, and gives indication of a mind indulging itself in melancholy. His sonnets are the best specimens of his muse, though even in them one looks in vain for sustained harmony or great originality of thought.

DRUMMOND ISLAND: Canadian island, in Lake Huron, most westerly of the Manitoulin chain. It measures 20 m. by 10, and lies about 30 m. e. of Mackinaw Island, which is in Mackinaw Strait connecting Lake Michigan with Lake Huron.

DRUMMOND LIGHT, or LIME LIGHT: brilliant light, practically applied by Capt. Drummond, R.E. (see DRUMMOND, THOMAS). The heat given out during the combustion of a mixture of hydrogen and oxygen gases, or of coal-gas and oxygen, is intense; and when the mixture is directed on an infusible substance such as lime, a most brilliant light is evolved. The most convenient form of the appa-



ratus is represented in the figure, where the mixed gases escaping by the jet *a*, being set fire to and made to impinge upon the cylinder of lime *b*, raise the surface of the latter nearest the jet to a white heat, accompanied by a dazzling light. As minute portions of lime become detached and are volatilized from the spot on the lime on which the jet of burning gases strikes, it is necessary to expose a new surface of lime to the gases, and for this purpose the screw *c* may be turned by the hand or by clockwork. The hydrogen and oxygen ought to be confined in separate gas-holders or bags, and to be brought by different tubes, *H* and *O*, provided with separate stop cocks, to within a short



Drummond Light Apparatus.

distance of the exit jet. The common tube through which the mingled gases pass to the jet is about six inches long by two-thirds of an inch in diameter; and in Mr. Hemming's construction the tube is very closely packed, full of very fine brass wire, which is afterward wedged in by a stout wire driven down the centre. The object of the fine wires is to prevent the return of the flame, which might lead to a disastrous explosion. When the rays from this light are concentrated by a parabolic reflector, it can be seen at immense distances. Thus, 1845, Dec. 31, at 3.30 P.M. (day-light), the light was exhibited on the top of Slieve Donard, in county Down, Ireland, and was seen from the top of Snowdon, a distance of 103 m.; and the D. L. has been seen 112 miles. The employment of coal gas instead of hydrogen has greatly increased the applications of the D. L., and it is now often used in magic-lanterns and other apparatus where great brilliancy and penetration of light are required. Great caution is needed in the preparation, storing, and employment of the gases, as many dangerous explosions have occurred. Little heat is evolved from the D. L., nor does it vitiate the surrounding air, or consume its oxygen.

DRUNK, *a. drüngle* [from DRINK, which see]: overcome by alcoholic liquor; intoxicated; stupefied by the action of spirit on the stomach and brain. DRUNK'EN, *a. -ën*, given to over-indulgence in alcoholic liquor; done when intoxicated, as a *drunken* frolic. DRUNK'ARD, *n. -ërd*, one given to the excessive use of strong drink. DRUNK'ENLY, *ad. -lī*. DRUNK'ENNESS, *n. -ën-nēs*, habitual intemperance; inebriety.

DRUNK'ENNESS: see INTOXICATION: DELIRIUM EBRIOSUM: DELIRIUM TREMENS: TOTAL ABSTINENCE.

DRUPE, *n. drôp* [F. *drupe*—from L. *drupa*: Gr. *druppa*,

## DRUPOSE—DRURY.

an over-ripe wrinkled olive; Gr. *drupēpēs*, a ripe olive]: in *bot.*, succulent fruit containing a single seed or kernel which is usually inclosed in a hard 'stone,' the *endocarp*. The succulent part is the *mesocarp*. Examples are familiar in the fruits generally known as stone-fruits, the peach, plum, cherry, etc. In the almond, the mesocarp is not succulent, yet the fruit otherwise possessing all the characters of a D., receives that name: it may be regarded as intermediate between a D. and a nut. The date is a D. in which the hard 'stone' is represented by a membrane. DRUPACEÆ, species of plants, sometimes assigned as a sub-order of *Rosaceæ* (q.v.); with fruit indehiscient, one-celled, and one-seeded; e.g. the peach and cherry. DRUPEL, n. *drō'pēl*, many tiny drupes aggregated together in such a fruit as the raspberry, the blackberry, etc., of the genus *Rubus*. DRUPACEOUS, a. *-pā'shūs*, having the form of a drupe; consisting of or producing drupes.

DRUPOSE, n. *drō'pōz* [Eng. *drupe*, and glucose]: in *chem.*, a substance produced together with glucose by the action of moderately diluted hydrochloric acid on glycodruse, the stony concretions found in pears. It is a grayish-red body. By boiling it with dilute nitric acid, and treating the residue with water, ammonia, and alcohol, yellowish white granules are obtained, which exhibit the properties of cellulose.

DRURY, *drō'rī*, DRU: 1725, Feb. 4—1804, Jan. 15; b. London: goldsmith, silversmith, and cutler, in London. He applied himself to the study of entomology and the collection of exotic insects. His *Illustrations of Exotic Entomology* (2 vols Lond. 1773-82), a work unrivalled at its publication for the accuracy and beauty of its figures, is still in repute as a book of reference.

## DRUSE—DRUSES.

**DRUSE**, n. *drós* [Gr. *drōsōs*, dew: Ger. *druse*]: a hollow or cavity in rocks lined or studded with crystals, sometimes filled with water. **DRUSY**, a. *dró'si*, lined with very minute crystals.

**DRUSES**, n. plu. *dró'z's*: remarkable people who inhabit a district in the n. of Syria, comprising the whole of the s. range of Mount Lebanon and the w. slope of Anti-Lebanon. They speak Arabic, and are nominally Mohammedans, but with some slight leavening of Christianity, and much mysticism, in their Deistic creed. In the district above noted, they hold exclusive possession of about 40 towns and villages, and divide about 200 more with the Maronites (q.v.), while 80 villages in other parts of Anti-Lebanon are peopled by them. The inhabitants of the Lebanon afford a remarkable illustration of the amalgamation of races. After the second captivity of Israel, Esarhaddon re-peopled the wasted strongholds of Samaria with certain fierce tribes, some of whom, called in the Scriptures Cuthites, and known in subsequent times to the Greeks as Carduchi, and to us as Kurds, settled in Lebanon. From them the present D. are supposed to have sprung. More than a thousand years later, a fresh colonization took place. The Mardi, a warlike tribe who dwelt n. of the Caspian, of Persian extraction, were transplanted thither by Constantine IV., A.D. 686, to the number of 12,000, to act as a bulwark against Mohammedan invasion. The Arabs also, in sweeping through the mountain-fastnesses, left a permanent impression there. Thus, Cuthites, Mardi, and Arabs, or rather Mohammedans of various races, have combined to form that strange being—the modern Druse. It has been supposed by some that there runs in his veins also not a little of the blood of the Crusaders, but this is doubtful. No immigrations, however, of any importance into the country of the Druses took place after the close of the 10th c.; and this period seems naturally to conclude the first great section of Druse history.

The nationality of these mountaineers having now been consolidated, their peculiar and mysterious religion began gradually to be developed. Hakem Biamr Allah, or Berrillah, caliph of Egypt, and a Nero in cruelty, was the author of this system. He affirmed that he was the representative of God, and, having enlisted his confessor, Darazi, in his cause, he prepared to propound his doctrine. In the 407th year of the Hegira (1029), the divine nature of Hakem, or rather the incarnation of the Spirit of God in him, was publicly announced at Cairo. This revelation, however, was unfavorably received by the mob. Hakem's confessor, Darazi, narrowly escaped the fate of a martyr to the impostures of his master. Retiring, however, to the fastnesses of the Lebanon, he there began to inculcate the principles of the new faith; and though he never acquired any mastery over the sympathies of the mountaineers, he at least left his name to them; for there can be little doubt that the name D. is derived from that of Darazi. Hamzé, Persian mystic, successively disciple and vizier of Hakem, introduced into the newly promulgated religion all the elements of attrac-



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tion and strength which it possesses; and him the D. venerate as the actual founder of their faith.

The D. are one of the very few sects among whom proselytism is discouraged. They are remarkable conservatists. For 800 years they have maintained a distinct religious and political independence and nationality. Into their faith the doctrines of the Pentateuch, the Christian Gospel, the Koran, and the Sufi allegories, are wonderfully interwoven. They reject, however, the seven points of Islamism, substituting for them the following seven:—1. Veracity (to each other only); 2. Mutual protection and resistance; 3. Renunciation of all other religions; 4. Separation from all who are in error; 5. Recognition of the unity of God; 6. Resignation to his will; 7. Obedience to the commands of God. They believe in one God in whom there are no parts, to whom they ascribe no attributes, before whom the tongue ceases to utter, the eyes to behold, but who has revealed himself ten times upon the earth under the form and name of mortal men. In Hakem, so Hamzé taught, had God revealed himself for the tenth and last time. They believe also that the number of existing souls never varies, and that all the souls in life now, have lived, vested in some human form, from the beginning of the world, and will so continue till the end of it; that when a man dies, his soul puts on a fresh humanity, which occupies a rank in moral dignity corresponding to the purity or impurity of the past life. But though they believe, in this sense, in the transmigration of souls, they believe also that after the lapse of ages, when the soul will have been purified from every stain, there will come a period of rest. As a religious body, the D. are divided into two classes: the Akals, or those initiated into the Druse mysteries; and the Djahils, the uninitiated. The former do not adorn themselves with gold, or wear silk, embroidered, or fanciful garments; they forbear using wine, spirits, tobacco, and other luxuries; never swear, utter obscene language, or lie. The latter are free from all religious duties. But, however rigid the profession of the Akal or initiated Druse, he is taught that his practice may be conducted in some cases on the principle of expediency. To be truthful, he is taught, is desirable; but when concealment is necessary, then equivocation, or even falsehood, may be practiced.

Previous to 1840, Druse and Maronite lived on terms of intimacy and friendship. At that period, however, dissension sprang up between the two tribes, and proved to be the introduction to years of intermittent warfare. The strife reached its climax in 1860. From May to October of that year, accounts of the fearful barbarities practiced by the D. upon the Maronites followed each other with appalling frequency, until the indignation of Europe was roused against them. A conference of the five Powers which had guaranteed the independence of Turkey met at Paris, and it was resolved that a French army should proceed to Syria to chastise the D., and that, at the same time, a European commission should, on the spot, make inquiry as to the facts. The troops reached Syria, 1860, Aug. They could

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not, however, get access to the D., who retired into the Desert of the Hauran. In the meanwhile, it was ascertained beyond all doubt that the Turks, and the low fanatical mob of Damascus (who have frequently been confounded with the D., because they fomented their passions), were mainly chargeable with the crimes that had been committed; and that the retaliation of the Maronites was equally vindictive and horrible. It is stated that the Maronite leaders—in most cases bishops—on being asked to furnish sworn lists of such of the D. as, from the unusual atrocity of their crimes, were worthy of death, sent in a list demanding 4,946 heads; refusing, however, to bring forward any particular charges. Punishment was inflicted on those who were found really to blame. While the French troops remained in Syria, the Turks were compelled to punish the chief Mohammedan criminals, a considerable number of whom, including Achmet Pasha, gov. of Damascus, were shot. In June, 1861, the troops returned to France, and the commissioners drew up a new constitution for the Lebanon, finally revised and signed, 1864, Sep. 6. Under it, the Lebanon is to be ruled by a Christian governor, appointed by the Porte; and to be divided into seven districts, under chiefs of the prevalent religion in each. The result was the appointment, as gov., of Daoud Pasha, an Armenian Christian, and of 7 chiefs (4 Maronite, 1 Druse, 1 Orthodox Greek, and 1 Separatist Greek). The constitution did not satisfy the Maronites, whose revolt under Joseph Karam, kept the Lebanon in a very unsettled state till 1867. During this period, the governor had to restrain the D. from attacking the Maronite villages in the absence of their defenders. The D. are about 80,000 in number; they are a brave, handsome, and industrious people, and almost all can read and write. They had no high educational establishment until Daoud Pasha founded and endowed one at Abey. Polygamy is unknown among them. They have, with incredible toil, carried the soil of the valleys up and along the hillsides, which are laid out in terraces, planted with mulberry, olive, and vine. Their chief trade is the manufacture of silk. Grain also is raised, though in very small quantity. Deir el-Kamar is the principal town. See *Druses of the Lebanon*, by the Earl of Carnarvon; Guy's *La Nation Druse*; Oliphant's *Land of Gilead* (1880).

DRUSUS, *drō'sūs*: distinguished family of the gens Livia, which contributed a large proportion of eminent men to the Roman commonwealth. The most conspicuous of the Drusi, were the following.

M. LIVIUS DRUSUS, tribune of the people, B.C. 122, who made it the business of his public life to thwart the democratic policy of his colleague, C. Gracchus, and uphold the cause of the senate and nobles, which he did with skill and ultimate success.

M. LIVIUS DRUSUS, son of M. Livius, dangerous and daring political intriguer. Acting partly for the benefit of the aristocratic party whose sympathies he inherited, and not less for his own aggrandizement, he kept Rome in perpetual turmoil from B.C. 100 till his death, B.C. 91. Though



## DRY.

identified by birth and sympathy with the patricians, Drusus, to win the people, renewed some of the most liberal measures of the Gracchi, and carried agrarian and frumentarian laws. During the latter years of his life, he contrived to gather into his own hands the threads of the various political movements which resulted in the Social War; but his almost incredible pride and arrogance had made him so many enemies, that his death, in the flower of his age, was regretted as little by his friends as by his foes.

NERO CLAUDIUS DRUSUS, most illustrious of the Drusi; commonly called Drusus Senior, b. B.C. 38; stepson of the emperor Augustus, and younger brother of the emperor Tiberius. He early developed splendid personal qualities as well as the highest capacity for civil and military affairs. He began his public career B.C. 19, and signalized himself when only 23 years old by his defeat of the Rhæti and other Alpine tribes which infested n. Italy. In B.C. 13 he was sent into Gaul, then in revolt, and, after crushing the rebels there, pushed across the Rhine in pursuit of their German allies. In this campaign he subdued the Sicambri and Frisii, and forced his way to the German Ocean, being the first Roman general who had done so. From this time he made the business of his life to establish the Roman supremacy in Germany, partly by conquest, and partly by the execution of great military works. Among these were the canal joining the Rhine with the Yssel, the two bridges over the Rhine itself, and the embankments of the Vahal, the Waal. In B.C. 11 he conquered the Usipetes, the Cherusci, and the Suevi; in the following year, the Chatti, the Nervii, and was prosecuting the work of subjugation in B.C. 9, when a fall from his horse cut short his brilliant career in his 30th year. For his exploits in Germany, Drusus was rewarded with the title of Germanicus, but care must be taken not to confound him with the celebrated Germanicus, his son. See GERMANICUS.

DRY, a. *drī* [AS. *drig*; Dut. *droog*; Ger. *trocken*; Icel. *thurr*; Dan. *tor*, dry, arid]: free from water or moisture; not rainy; not juicy; arid; thirsty; barren; void of interest, as applied to a book, a discussion, etc.—as applied to persons, sarcastic; severe; humorous; stupid; silly; insipid; not sweet; in *art*, exhibiting a sharp, frigid preciseness of execution, or the want of a delicate contour in form, and of easy transition in coloring: N. in *mason.*, a crack or fissure in a stone running through it at various angles to its bed, and rendering it unfit to carry any load; in *chem.*, an emetic consisting of tartarized ammonia and sulphate of copper, in equal proportions and taken without liquid: V. to free from water or moisture, as by wiping; to lose moisture. DRY'ING, imp. DRIED, pt. or pp. *drīd*. DRY'ER, or DRI'ER, n. he who or that which dries; a substance mixed with oil-paint to make it dry more quickly. DRYLY, or DRILY, ad. *drī'ly*, without moisture; coldly; without affection; sarcastically. DRY'NESS, n. want of moisture; in *painting*, technical term for a style in which the drawing is



hard, angular, and formal, and the color deficient in harmony and mellowness, though not necessarily in power or richness. The earlier works, both of the Italian and Flemish schools, all more or less partake of this defect; and it is the prominent characteristic of those of their imitators to whom the name of pre-Raphaelites has been given. DRY-ARCH, n. in *arch.*, employed in the foundations of buildings for the purpose of keeping them dry. DRY-BLOW, n. a hard or sharp blow; in *med.*, a blow which neither wounds nor sheds blood. DRYFOOT, n. a dog that hunts by the scent of the foot only. DRY-FRUIT, n. in *bot.*, one without pulp. DRY-GILDING, n. a mode of gilding, by steeping linen rags in a solution of gold, burning the rags, and with a piece of rag dipped in salt-water rubbing the ashes over the silver intended to be gilt. The method was invented in Germany, and is first described in England in the *Philosophical Transactions* for 1698. DRY-GOODS, woolen and cotton cloths, etc., as distinguished from groceries. DRYING OILS: see OILS. DRY-POINT, sharp etching-needle used to incise fine lines in copper, without the plate being covered with etching ground, or the lines bitten in by acid: see ENGRAVING. The work produced by the dry-point is not only very delicate, but it wears less in printing than lines produced by acid. DRY-POINTING, n. the grinding of needles and table-forks. DRY-ROT, a rapid decay of timber by which its substance is converted into a dry powder. DRY-SALTER, n. *-sawł-tér*, formerly, a dealer in dry or salted meats; now, a dealer in gums, drugs, dye-stuffs, and in chemical substances generally. DRY-SAL'TERY, n. *-ř*, the goods or business of a drysalter. DRY-NURSE, a nurse who brings up children without the breast. DRY-PILE, galvanic or voltaic battery without liquids, supplying a feeble current: see GALVANISM.—DRY-PIPE, n. in *steam-eng.*, a pipe which conducts dry steam from the boiler. The steam is collected in such a manner as to be free from priming. DRY-SHOD, without wetting the feet. DRY STOVE, in *garden-ing*, Eng. term for a hothouse in which the air is kept less moist than in the bark stove. In structure and in management, except that the temperature is kept higher, it agrees more nearly with the green-house. The dry stove is particularly adapted to succulent plants. As free an admission of air is allowed in the dry stove as is consistent with the maintenance of the temperature. DRY-WINES, wines free from sugary matter. To DRY UP, to deprive wholly of moisture.

DRYAD, n. *drī'ăd* [L. *dryădēs*, nymphs of the woods—from Gr. *drus*, an oak-tree]: inferior deity or a nymph supposed in Gr. myth. to watch over woods; the appointed guardians of the larger forest trees with which they came into being, and with which they died.

DRYANDRA, n. *drī-ăn'dra* [named after M. *Dryander*, a Swedish botanist]: in *bot.*, genus of evergreen shrubs, belonging to the order *Proteaceæ*, natives of Australia, cultivated in other countries for the variety of the forms and colors of the leaves. The flowers are yellow, formed in cylindrical clusters.

## DRYAS—DRYDEN.

**DRYAS**, n. *drī'ās* [Gr. *druas*, a Dryad, a nymph of the oak. So named from the leaves bearing some resemblance to those of the oak]: in *bot.*, a genus of plants belonging to the ord. *Rosaceæ*. They are small, low shrubs, bearing white or yellow flowers, with long feather-awned achenes.

**DRY-AS-DUST**, n. *drī'ās-dŭst* [Eng. *dry-as-dust*]: a very dull prosy author, an antiquary.

**DRYDEN**, *drī'dèn*, **JOHN**: poet: 1631, Aug. 9—1700, May 1; b. Aldwinkle, Northamptonshire, England. His father, Erasmus Driden, was the third son of Sir Erasmus Driden, created baronet 1619. D. received the rudiments of his education at Tichmarsh, and was afterward admitted a king's scholar at Westminster School, under Dr. Busby. Here, 1649, he wrote an *Elegy on the Death of Lord Hastings*, and some commendatory verses on the *Divine Epigrams* of his friend John Hoddesdon; both of which performances were published 1650. In 1650, May, he was elected to a scholarship in Trinity College, Cambridge; he took the degree B.A. 1653-4; and was made M.A. 1657. His father dying 1654, left him an estate worth £60 per annum, of which sum his mother had life-interest in a third. After leaving the univ. he went to London, under the patronage of Sir Gilbert Pickering, who was faithful to the Protector, and seems to have aroused for the time the same feeling in his protégé, whose first poem of importance was entitled *Heroic Stanzas on the Death of Cromwell*. On the return of Charles II., D., with equal splendor of diction, and perhaps with equal sincerity, congratulated the Restoration.

The publication of a poem, entitled *Astræa Redux*, led to a breach between the poet and the family of Sir Gilbert Pickering, and D. now became author by profession. He turned his attention to the stage, planned *The Duke of Guise*, and wrote his first acted play, *The Wild Gallant*. In 1663, Dec., he married a daughter of the first Earl of Berkshire, with whom he received a portion; and in 1670 he was appointed poet laureate and historiographer, with a salary of £200 a year. He afterward entered into an arrangement with the theatres to supply them with three plays each year, for which he was to receive annually from £300 to £400; but as he did not fulfil his share of the contract, it is not probable that the theatres fulfilled theirs. In 1671, the Duke of Buckingham produced his attack on the English heroic drama, of which D. was then the head. This satirical piece was entitled *The Rehearsal*, and when it was brought on the stage, the town was amused. Although personally satirized, D. endured his castigation in silence, and, waiting his opportunity, immortally revenged himself on the witty and profligate duke in the *Absalom and Achitophel*, 1681. This magnificent satire arose out of the political commotions of the times, and is an elaborate defense of the king against the whig party. Charles II. is *David*; Monmouth, *Absalom*; Cromwell, *Saul*; Buckingham, *Zimri*; and Shaftesbury, *Achitophel*. Its success was amazing; it ran through five



## DRYING-MACHINES.

editions within the year. This great poem and its success enraged D.'s enemies who hovered around him like a cloud of gnats. In the same year he published *The Medal*. Elkanah Settle, one of the most virulent of his foes, replied with some effect; and D., thoroughly roused, issued next year the *Mac Flecknoe*, and the second part of *Absalom and Achitophel*. These satires were as overwhelming as the Italian battles of the first Napoleon; D.'s enemies were crushed for ever, and he remained during his lifetime the undisputed king and lawgiver of English literature.

After the death of Charles II., D. became a convert to the Rom. Cath. faith. This event was announced to the world by the publication of *The Hind and Panther*, 1687. For this change of faith, he has been much abused. Macaulay calls him 'an illustrious renegade.' Mr. Bell, one of his biographers, strenuously defends his conscientiousness. At the Revolution, he was deprived of his laureateship, and somewhat straitened in circumstances, he fell back upon his old occupation of writing for the stage. His translation of *Virgil* was begun 1694, and completed by the close of 1696. A month after the publication of *Virgil*, appeared the *Ode on Alexander's Feast*. In 1698, he commenced his *Fables*, and completed them in a year and a half. His last work was a masque, with prologue and epilogue. He was buried in Westminster Abbey, where a monument was erected to his memory by John, Duke of Buckingham.

Though the great bulk of D.'s works is composed of plays, and though these are, for the most part, devoid of character, feeble in sentiment, false to all external nature, and exaggerated in expression, he remains one of the prime glories of English literature. His *Satires* and his *Fables* are master-pieces. In these, he is almost always masculine and natural, and his versification flows on broad, deep, and majestic. Nor is it only as a poet that he excels; his prefaces and *Essay on Dramatic Poesy* show him a master of 'that other harmony of prose.' His works, in 18 vols., were edited by Scott.

**DRYING-MACHINES:** for clothes and cloth fabrics. The ordinary process of drying by exposure in the open air, has been found too tedious for the bleacher, dyer, and for large laundry establishments; and hot-air chambers have been extensively used; but a great improvement has been made by using the principle of centrifugal force to throw off the greater part of the moisture. The drying-machine commonly used consists of two drums or cylinders open at the top, the inner one, into which the goods are packed, is perforated at its sides, and made to revolve with great velocity either by steam, water, or hand-power. The action of the drying-machine is the same in principle as that witnessed when the housemaid is *trundling* a mop, or of the dog when he shakes himself on coming out of the water. The use of the outer cylinder is merely to catch the drops of water thrown out, and prevent the inconvenience that would result from its distribution through the apartment. A pipe connected with this outer drum car-



## DRYTE—DRY PROCESS.

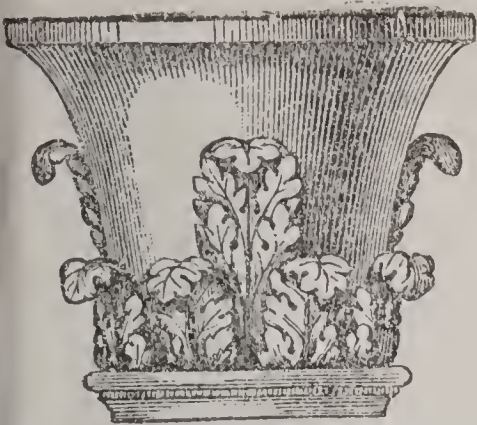
ries the water away. The drying is not, however, quite completed by such machines; a very slight degree of moisture remains, just perceptible to the touch if the goods are pressed against the cheek. This is expelled by open-air or hot-chamber drying. These drying-machines are commonly called 'extractors' by dyers. A simpler and cheaper drying-machine has been lately introduced for domestic use. It is small, and consists of two rollers mounted parallel, and one above the other, with an adjustment to vary the distances between them. One end of the article to be dried is inserted between the rollers, which are then brought as close as possible together, and one roller is turned by a handle, the other, being free to revolve, turns also as the clothes pass between them—the moisture in this case being extracted by pressure, as in the common process of 'wringing,' though the fabric is left damp. In the U. S., this is called a wringing machine or wringer.

DRYTE, n. *drī'te* [Gr. *drus*, a tree, an oak]: in *geol.*, a name applied to fragments of petrified or fossil wood, in which the structure of the wood is recognizable.

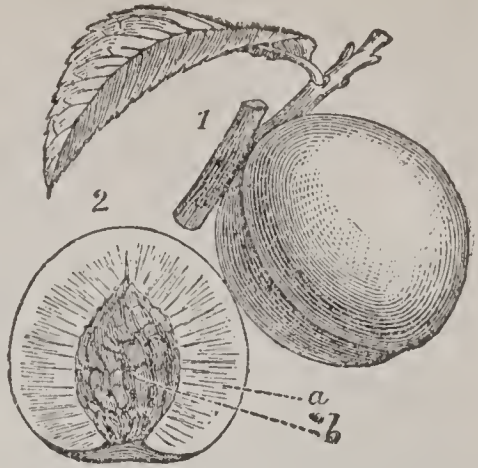
DRYOBALANOPS: see CAMPHOR.

DRYOPHIS, *drī'o-fīs*: genus of serpents of the family *Oclubridæ*, allied to *Dendrophis*, and, like those of that genus, of very elongated form, and living mostly among the branches of trees, but distinguished by a projecting muzzle—a curious prolongation of the upper jaw, which in some is slender, in some leaf-like. They are natives of the E. Indies, Madagascar, and tropical America.

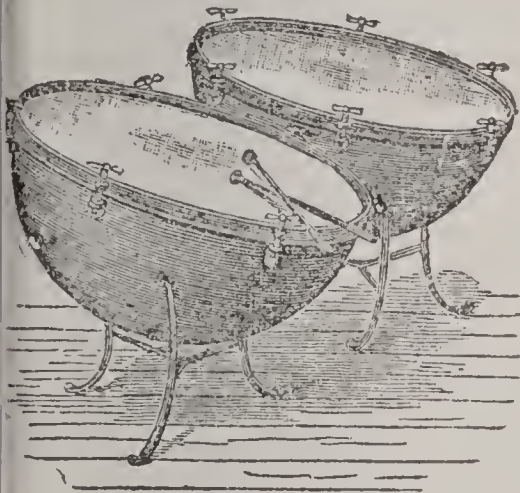
DRY PROCESS: in Photography. The collodionized glass-plate, on being withdrawn from the bath, previous to, and during exposure in the camera, has mechanically adhering to its surface a quantity of solution of free nitrate of silver, and it is partly upon the presence of this salt that the extreme sensitiveness of wet collodion plates depends: see COLLODION (COLLODIONIZED PAPER PROCESS). This, however, is not the sole cause of sensibility to actinic rays; carefully conducted experiments fairly lead to the assumption, that the molecular arrangement of the ultimate particles of iodide of silver, and of the pyroxyline, forming, as it were, the network of the film while wet, materially affect this necessary condition; and it is the object of what is termed a *dry process* to preserve this molecular arrangement as far as possible unaltered, notwithstanding the disturbing influence which would necessarily be exerted by the desiccation of the film. This desirable end for travelling photographers is accomplished with more or less certainty by the employment of solutions of various substances, which are poured over the film after the adhering nitrate of silver has been removed by copious washing with water. The heterogeneous character of the substances so used goes far to prove that their action is principally *mechanical*, they being selected from the animal, vegetable, and mineral kingdoms. Among animal, are honey, gelatine, glycerine, milk, and albumen; among vegetable, syrups, gum, wine, beer, bal-



Drum of Corinthian Capital partly stripped of its Foliage.



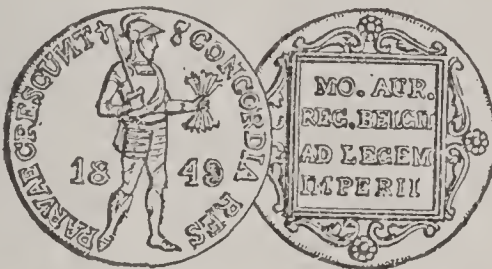
1. Drupe of Peach; 2, Section of Peach: *a*, Mesocarp; *b*, Endocarp.



Kettle-drums.



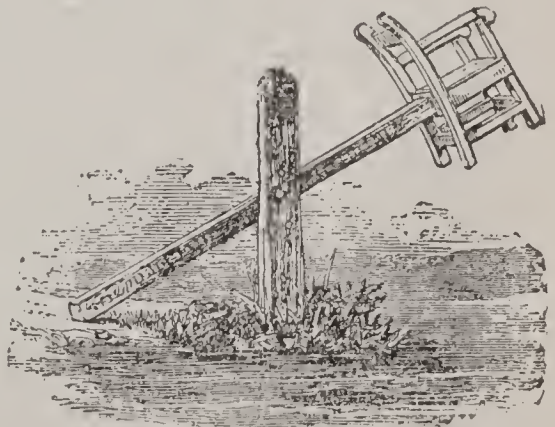
Drupe.



Dutch Ducat.



Dry Rot Fungus (*Merulius lacrymans*).



Ducking-stool.



## DRY ROT.

sams, and resins added to the collodion, and linseed tea; and among the mineral, chloride of calcium, nitrate of zinc, and nitrate of magnesia. The plate, on removal from the sensitizing bath, being well washed with water, any one of these substances is dissolved in water in suitable proportion, and applied to the surface of the plate by pouring on and off several times. It is then set up to drain and dry on folds of bibulous paper in a dark closet or box. The plate is then ready for use. The pictures obtained on plates so prepared do not suffer by comparison with those taken by the wet collodion process; the only drawback to their use being a slight diminution in the degree of sensibility to light.

DRY ROT: a kind of decay, often very rapid, to which timber is subject, without the presence of much moisture. It has proved ruinous to many valuable edifices, and has caused many serious accidents. The ends of joists are often affected by it, so that upon being burdened with even a slight additional load, they are ready to break off by the wall; and the process of destruction has often gone far without a suspicion being entertained of anything wrong. D. R. is occasioned by *fungi*, the *mycelium* of which diffuses itself through the substance of the timber, destroying its texture, and reducing it to a fragile or even friable mass, while the surface may show scarcely any signs of decay. *Merulius lacrymans*, *M. vastator*, and *polyporus destructor* (see AMADOU), are species commonly productive of this mischief. Other fungi, however, produce the same effects where none of these are present; but besides the species which are well ascertained, there are some forms of mycelium frequently occurring as D. R., of which it is uncertain to what fungus they ought to be referred, as they have not been observed to develop themselves in any perfect form, while also it is not known what different modifications of appearance the mycelium of the same fungus may show in different circumstances. Very destructive ravages have been ascribed to different species of *sporotrichum*, particularly in the naval yards of Britain; but the genus is altogether a doubtful one, and not improbably consists of mere forms of undeveloped mycelium. Several species of fungi are often present together in timber affected with D. R. Some penetrate deeply into the substance of the timber, others spread more superficially, but attract moisture from the atmosphere, which hastens decay. This is the case with *merulius lacrymans*, which appears first in small white points; a filamentous substance, radiating from these, gradually forms broad patches, sometimes many feet in diameter; from these, long creeping shoots often proceed, and a net-work of filaments penetrates into every crevice. The species of *polyporus* more generally fill the whole mass of the timber with delicate filaments, which destroy the cohesion of its fibres. *Dædalea quercina* appears in the form of leathery laminæ, often in the strongest oak, and the delicate threads of mycelium penetrate every duct and cavity, reducing the whole to a fungous mass. Beautiful orange



## DRY TORTUGAS.

tufis sometimes appear, supposed to be the mycelium of species of *coprinus*.

Of the causes of D. R., stagnation of air, as behind a wainscot or under a floor, is certainly one of the chief; and a knowledge of it suggests means of prevention which may often be easily and advantageously employed. Another principal cause is insufficient drying of the timber itself; and much of the prevalence of D. R. is probably due to the practice of felling oak in spring for the sake of the bark, when the wood is full of sap. Any circumstance which may tend to render the sap acidulous, greatly increases the liability to D. R. The production of fungi is unusually rapid when by fermentation or otherwise an acidulous condition of organic substances is produced. A fermentation and chemical change in the albuminous constituents of the wood, is probably the immediate cause of D. R., providing a soil suitable for the vegetation of fungi.

Among the methods for the prevention of D. R.—in addition to the freer circulation of air and more thorough seasoning of the timber—the expulsion of the sap and impregnation by means of an air pump, with some substance of an antiseptic nature is the most promising. In 1832 Ryan invented his famous preservative consisting of one lb. of bichloride of mercury to four gallons of water. Others have used chloride of zinc, sulphate of copper, oil of creosote, and similar substances. The dissipation of the sap followed by the subjection of the wood to the vapor of coal tar, resin, or bituminous oils, at a temperature of 325° also is a successful method of more recent introduction. Fluids readily follow the grain of the wood, but penetrate it slowly in other directions; therefore the pressure upon wood to be impregnated with a preservative must be exerted endwise. The ordinary degree of force is 150–200 lbs. per sq. inch. The quantity of the solution absorbed varies with different kinds of wood from about two and one-half to three and three-fourths lbs. per cubic ft. in a period of seven days. The strength of the timber is not diminished by these solutions. Timber that is thoroughly seasoned and properly protected may retain its integrity for a long period as is proved by the sound condition of the wood in several English structures which were erected about 1,000 years ago, and by the fact that perfectly sound wood has been taken from the frieze of the Parthenon where it had been more than 2,300 years. Also charred wood has been found in the ruins of Nineveh.

DRY TORTUGAS. *tawr-tó'gas*: cluster of 10 small islands belonging to Monroe co., Fla., 40 m. w. of Fla. Keys proper, 120 m. w.s.w. of the s. extremity of the mainland; at the entrance of the Gulf of Mexico; lat. 24° 37' n. long. 83° w. They are very low and covered with mangrove bushes where not wholly barren. The U. S. govt. has erected two important light-houses, one on Loggerhead Key, the other inside Fort Jefferson on Garden Key. During the civil war these islands were used as a place of confinement for deserters, bounty-jumpers, and persons

## DUAL—DUAL ALLIANCE.

under court-martial sentence, and afterward the conspirators in the Lincoln assassination who escaped hanging were sent there.

**DUAL**, a. *dū'āl* [L. *duālis*—from *duō*, two]: expressing the number two. **DU'AD**, n. *-ād*, a union of two. **DUAL**, in *gram.*, form given in some languages to a noun or a verb, when only two things are spoken of. Thus, in Greek, *pater* is father, *patere*, two fathers; *pateres*, fathers. To have a dual number in addition to a plural, is often spoken of as a refinement of language. It argues, however, a higher degree of abstraction to be able to conceive every subject as one, or more than one, than to require three classes—one, a pair, and more. Accordingly, it is only in some of the more ancient languages that we find traces of a dual number, and it becomes lost as the power grows of analyzing concrete impressions. Sanskrit, ancient Greek, Arabic, and Hebrew have the dual number, the last only in nouns. Modern Greek has lost the dual. The only trace of it in Latin is in the two words *duo*, two, and *ambo*, both. It is wanting in the Germanic languages, with the exception of the ancient Gothic, which had a dual form of the verb. In Anglo-Saxon, there was a separate form of pronoun for 'we two' (*wit*) and 'ye two' (*git*). **DUALISM**, n. *-āl-izm*, philosophical theory, according to which some two principles, of different nature, original, and incapable of being derived the one from the other, are at the foundation or the origin of everything; as, for example, the ideal and the real, or the material and the thinking substance. In a theological sense, dualism means the assumption of two original beings, a good and an evil, as in the doctrine of Zoroaster, or of two distinct principles in man, a bodily and a spiritual. The opposite of dualism is Monism. **DU'ALIST**, n. *-ist*, one who adopts dualism. **DU'ALIS'TIC**, a. *-is'tik*, consisting of two. **DUAL'ITY**, n. *-āl'ī-tī*, state or quality of being two; that which expresses two. **DUALIN**, explosive compound of two substances, nitro-glycerine and sawdust, intended to be less dangerous than nitro-glycerine alone in storage and transportation. **DUALISTIC-SYSTEM**, in *chem.*, the view that salts are formed by the action of two binary compounds.

**DUAL ALLIANCE**: reported alliance between France and Russia (1896-7). It is positively but not officially stated that a formal agreement between the French and Russian governments was signed at Moscow on the eve of the coronation of Nicholas II. The two powers are said to have mutually agreed to defend the integrity of their territory, undertaking to defend each other against all foreign aggression, but reserving their liberty of action in the event of either power beginning an aggressive campaign against any other state. By the French constitution such a treaty could not become definitely binding until adopted by the *Corps Legislatif* after public discussion; but that an *entente cordiale*, or cordial understanding, exists between the empire and the republic has long been evident. When the czar visited Paris in 1896 he was received

not only with the highest official courtesy, but with an unexampled outburst of popular enthusiasm. He was met, Oct. 5, 15 miles off the French coast by the French fleet and escorted into the harbor of Cherbourg. There he was received by Pres. Faure and other high officials. Numerous presentations followed; also an inspection of the French squadron. After an official banquet in the evening, at which the czar and Pres. Faure toasted each other in cordial but guarded terms, the imperial party started for Paris, where they arrived the following morning. There was (Oct. 6-9) a constant round of gorgeous festivities, and official ceremonials marked by such a display of pageantry and such an enthusiasm of popular excitement as had never been equalled in the history of international festivals. Among the noteworthy features were: the laying of the foundation-stone of the exhibition bridge—*Pont Alexandre III.*; the appropriation of 200,000 francs for the payment of rents for the poor, instead of free wine, as had been customary on similar occasions; and the great military review of the French troops by the czar at Chalons. The *fêtes* are estimated to have cost more than 12,000,000 francs. This was the first time since the formation of the Third Republic, 25 years before, that France had received as her guest a great European potentate, and in the visit of the czar to Paris Frenchmen saw an ostentatious political demonstration giving proof to the world that the *entente* of France with one of the greatest powers of history was now not only an acknowledged but a demonstrated fact; that France had now fully emerged from the long period of isolation and humiliation following the Franco-Prussian war, and had at last recovered her rank among the great European powers. The visit of the czar was returned by Pres. Faure (1897, Aug.), who was received with great distinction by the czar, court, and people. At the farewell naval review, the czar spoke of 'our two nations, friends and allies,' and the Russian fleet resounded with cries of '*Vive l'Alliance*' as the French fleet stood out to sea. The alliance is useful to Russia, as securing her against any alliance of France with England against Russia, as in the Crimean war in 1853; to France it is useful, as enabling her to maintain herself against Germany, though it is not generally believed that Russia would aid France in an offensive war to recover Alsace and Lorraine; to both nations the new alliance is valuable as a check to the power and the possible ambitions of the Triple Alliance that dominates central Europe.

DUANE, *du-ān'*, JAMES: 1733, Feb. 6—1797, Feb. 1; b. New York: lawyer. He inherited a large estate at Duanesburg, married a daughter of Robert Livingston, and became eminent as a lawyer. He was a member of the continental congress during its entire existence, of the N. Y. provincial congress 1775-77, and of the committee of safety. In 1776, he opposed the Declaration of Independence, urging that the action should not be taken before the arrival of the royal commissioners, nor before the people had expressed a desire for a change of govt. He was



## DUANE.

elected the first mayor of New York under the new charter, 1784-89, state senator 1782-85 and 1789-90, member of the convention that ratified the constitution 1788, and U. S. dist. judge 1789-94.

**DUANE, JAMES CHATHAM:** 1824, June 30—1897. Nov. 8; officer U.S.A. engineers: b. Schenectady, N. Y. On graduating at Union Coll. 1844 he entered West Point Milit. Acad., and 1848 received a commission in the engineer corps; was asst. instructor at West Point till 1856; inspector of light-houses at New York 1856-58; served in the Utah expedition 1858; was instructor at West Point again till 1861. Assigned to duty in the army of the Potomac in the winter of 1861, he served in the Peninsular campaign, organizing the engineer service and constructing important works. He was chief of the engineers in the Md. campaign, and was in the South Mountain and Antietam engagements; chief engineer of the dept. of the South 1863, and of the army of the Potomac again the same year, thus participating in many memorable operations, as those at Ft. McAllister, Charleston, Manassas Gap, Cold Harbor, Petersburg, etc. After the war he was employed in erecting fortifications on the n.e. coast, and as pres. of the board of engineers at New York till 1886, when he became brig.gen. and chief of engineers. He retired 1888, and became pres. of the aqueduct commission, New York.

**DUANE, WILLIAM:** 1760-1835, Nov. 24; b. near Lake Champlain, N. Y.: journalist. He went to Ireland at an early age, learned the printer's trade, received an appointment in the East Indian service, became wealthy, and established *The World* newspaper. Having criticized the local govt., he was seized by Sepoys while on his way to dine with Sir John Shaw, and sent back to England, and all his property was confiscated. He resumed journalism in London, while vainly endeavoring to secure the restoration of his property, returned to the United States 1795, and soon afterward became editor of the Philadelphia *Aurora*, an influential democratic organ. Pres. Jefferson appointed him lieut.col. in the army, 1805, July, and he served through the war of 1812-15 as adj.gen. In 1822 he retired from the editorship of the *Aurora*, and after visiting the republics of S. America became supreme court prothonotary at Philadelphia, and held the office till death. He was author of *The Mississippi Question* (1803), a *Military Dictionary* (1810).

## DUB—DU BARRY.

**DUB**, n. *dǔb* [Fris. *dobbe*, a puddle, a swamp: Scot. *dub*]: a small pool of rain-water; a puddle; a gutter.

**DUB**, v. *dǔb* [Prov. *adobar*, to arrange, to prepare: F. *aduber*, to rig or trim a ship: Sp. *adobar*, to dress or make anything up: but probably the root may be no other than the OE. *dup*, a contraction for *do up*, to dress, to invest with: comp. Icel. *dubba*, to strike]: to confer the title of knight-hood by a slight tap with a sword; to invest with any dignity or new character; to cut down or dress with an adze, as a plank of wood; to rub or dress leather with dubbing; in *plastering*, to fill up with coarse stuff irregularities in the face of a wall, previous to finishing it off with plaster. In modern usage, to dub is to entitle or name with humorous reference to informal or popular appellations. **DUB'ING**, imp. **DUBBED**, pp. *dǔbd*. To **DUB CLOTH**, to dress it with teasels. To **DUB A COCK**, to prepare it for fighting by cutting off its comb and wattles. *Note*.—The principal part of the ceremony of dubbing a knight was investing him with the habiliments of his order, putting on arms, sword, and spurs—*tapping* with a sword was the finishing act.

**DU BARRY**, *dü bár-ré'*, MARIE JEANNE GOMARD DE VAUBERNIER, Comtesse: favorite of Louis XV.: 1746, Aug. 19—1793, Dec. 7; b. Vaucouleurs. Her mother was a dress-maker, and her father, or reputed father, was an exciseman named Vaubernier. After the death of her father, she stayed for some time at a convent, but left it when 15 years of age; went to Paris, and assuming the name of Mademoiselle Lange, obtained employment in the establishment of a fashionable milliner; but in a short time renounced all honest occupation, and forming a connection with a disreputable house, met there the Comte Jean Du Barry, one of the most noted *roués* of his day, who made her his mistress. This person afterward introduced her to Lebel, valet-de-chamber of Louis XV., who presented her to his royal master, then nearly 60 years of age. She was at this time remarkably handsome, to some extent witty, and had a frankness, or it might be, a vulgarity of manner that amused the doting monarch. Desirous that *la petite Lange* should obtain a title, and be introduced to court, Louis prevailed upon Comte Guillaume Du Barry, brother of the comte already mentioned, to marry, and thereby confer his title upon, the favorite. Accordingly, in 1769, she was presented to court as the Comtesse Du Barry. After this period, many of the most powerful courtiers abased themselves before her. D'Aiguillon became her confidant, and in concert with her, ruled the doting king; the Chancellor Maupeou claimed a remote relationship with her, and by her influence succeeded in dismissing and exiling the parliament in 1771; the Abbé Terray, comptroller-gen. of finance, was *suave* to her, though insolent to all the rest of France. At no period, perhaps, was the court of France more openly and outrageously immoral than during the supremacy of this strumpet.

On the death of Louis, however, 1774, Du B. was dismissed from court, and sent to live in a convent near

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Meaux. She was afterward removed to her residence of Luciennes, and while living there was allowed a pension by Louis XVI. Some time after the outbreak of the Revolution, she went to London to dispose of her jewels. On her return, Robespierre caused her to be arrested, 1793, July. In Nov., she was tried before the Revolutionary Tribunal, and accused of 'having wasted the treasures of the state, of conspiracy against the republic, and of having, in London, worn mourning for the late king.' She was condemned to death, and was sent to the guillotine 1793, Dec. 7. Of all the women who mounted the scaffold during the Revolution, Du B. exhibited the least courage. She implored the 'good people' to deliver her, and Monsieur the executioner to prolong her miserable life for one moment only. The single good thing that history records of her, is her patronage of various artists and men of letters, but there is little reason to believe that it originated in anything higher than her dread of epigram and caricature. She had neither taste nor knowledge, and cared only for sensual gratifications and excitement. It is estimated that she cost France 35,000,000 francs. The *Mémoires* published under her name (6 vols. Par. 1829—30) are not trustworthy; but Vatel's *Histoire de Mdle. Du Bary* (3 vols., 1882—84); and Lacretelle's *Histoire de France pendant le 18me Siècle* may be consulted with confidence.

DUBBER, n. *dūb'bēr* [Hind. *dubbah*]: a leathern bottle or vessel, made of thin untanned goat-skins, and used in India to hold oil, ghee, etc.

DUBBING, n. *dūb'bing* [Bohem. *dub*, oak-bark; *dubiti*, to tan (see DUB 2)]: a dressing of flour and water used by weavers; a mixture of tallow, etc., for dressing leather. DUBBING-TOOL, n. same as adze.

DUBHE, n. [Ar.]: a variable star of the first magnitude in the northern constellation Ursa Major.

DUBIOUS, a. *dū'bī-ūs* [L. *dubīūs*, doubtful: It. *dubio*: L. *dubiētās*, doubt]: not settled; doubtful; not clear or obvious; uncertain; in *OE.*, in two directions. DU'BIOUSLY, ad. *-lī*. DU'BIOUSNESS, n. DUBI'ETY, n. *-bī'ē-tī*, doubtfulness. DU'BITABLE, a. *-bī-tā-bl*, doubtful; uncertain. DU'BITABLY, ad. *-blī*.—SYN. of 'dubious': ambiguous; equivocal; questionable; precarious; doubting; unsettled; undetermined.

DUBITZA, *dō-bēt'sā*. fortified town of European Turkey, on the n. frontier of Bosnia, on the right bank of the Unna, at a point about 10 m. from its confluence with the Save, of which it is a tributary. During the 16th and 17th c., it was a bone of contention between Austria and the Porte, and was repeatedly lost and regained by the latter. It is notable chiefly, for its heroic but unavailing resistance to the Austrians 1788. D. was subsequently restored to the Turks, but with the rest of Bosnia passed under Austrian administration 1878. Pop. 3,000.



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**DUBLIN**, *dub'lin*: maritime county in the e. of Leinster Province, Ireland; containing the metropolis of that country; bounded, n., by Meath; e., by the Irish Sea; s., by Wicklow; and w., by Kildare and Meath. It is the smallest but two of the Irish counties; 32 m. long, and 18 (average 12) broad; 354 sq. m., of which  $\frac{5}{7}$ ths are arable, and  $\frac{1}{40}$ th in wood. The coast, from its indentations with creeks and bays, is 70 m. long, and off it lie several isles. Dublin Bay, one of the finest in the kingdom, is 6 m. broad, 6 long, with a sweep of 16 miles. It has two precipitous hills, about 500 ft. high at its n. and s. ends; but the head of the bay is low and sandy. The coast is defended by 26 martello towers. The surface is mostly a level rich plain, with slight undulations, but rising in the south in a hill-range, the highest point of which is Kippure, 2,473 ft. North of this range, the only prominent eminences are Lambay Isle, or Ireland's Eye, and Howth Head, 503 ft. The only river of note is the Liffey, which runs through Dublin city into Dublin Bay. The Royal and Grand canals run w. through the county, and unite the Liffey and the Shannon. The chief rocks are carboniferous limestone, granite, and some metamorphic rocks and greenstone. There are copper and lead mines near Scalp. Fullers-earth and potters-clay occur. Iron and manganese are found on Howth peninsula. Granite and limestone are much used in building. There are many mineral springs, including 10 saline purgative ones, within the city of Dublin, and some tepid ones of 75° F. The climate is mild. The soil is generally a shallow calcareous gravelly clay. In the n. and w. are grazing and meadow farms, and around Dublin city, villas, kitchen-gardens, dairies, and nurseries. D. is the best cultivated county in Ireland. In 1891 there were in crop 73,498 acres, less than one third the county. The chief crops are oats (in 1891, 11,915 acres), wheat (4,023 acres), potatoes (8,053 acres). There are important fisheries along the coast of turbot, brill, sole, plaice, cod, ling, haddock, whiting, and oysters. The manufactures (chiefly of cottons, stockings, and embroidered muslins) are mostly confined to the city and the vicinity of the metropolis, and are of more value than in any other Irish county. Balbriggan is famed for its hosiery. The chief exports are from Dublin city. D. is divided into 9 baronies and contains 76 civil parishes, and 10 parts of parishes. The chief towns are Dublin, the capital of Ireland, and Kingstown. At the end of 1891 the county had 59,766 pupils on the rolls of its national schools. The county sends 7 members to parliament, two for D. county, three for D. city, and two for D. University. The manners, appearance, dress, and cabins of the lower orders in D. county differ less from those of the interior of Ireland than would be expected. There are numerous antiquities in different parts of the county. Pop. (1901), exclusive of Dublin city, 157,568; including the city, 448,206.

**DUB'LIN** (Irish, *Dubh'-linn*, 'black pool;' the *Eblana* of Ptolemy): capital of Ireland: on the river Liffey, where it

disembogues into Dublin Bay, lat.  $53^{\circ} 20' 38''$  n., and long.  $5^{\circ} 17' 30''$  w. It covers 1,300 acres, but its parliamentary boundary comprises an area of about 5,000 acres, and its municipal boundary nearly 4,000 acres. Much of D. is built on land reclaimed from the sea, a work which still continues; and the ground is generally flat, with few undulations, scarce deserving the name of hills. The river, running from w. to e., divides the city into two almost equal portions. The aristocratic parts are the s.e. and n.e., containing many beautiful squares, with splendid streets and terraces. The centre, and the n.w. quarter are the great emporiums of trade, and the residence of the middle classes, many of whom, however, have their private houses in the suburbs. The s.w. division, part of which is called the 'Liberties,' once the seat of the silk trade, is the most filthy and degraded portion of the city. The streets in this quarter are narrow, crooked, and irregular. The city is surrounded by a 'Circular road' nearly 9 m. in length, forming a favorite drive and promenade.

In the newer parts of D., the streets run at right angles to one another, and are remarkable for their breadth and the uniformity of their architecture, which, however, is so varied as to avoid monotony. The most imposing one is Sackville street, 120 ft. broad, and nearly 700 yards long; at its n. end stands the Rotunda, with Rutland square—in its centre, the beautiful Ionic portico of the general post-office, and Nelson's monument (upward of 150 ft. high)—while on the s., it is terminated by Carlisle Bridge, and a wedge-like block of noble houses formed by the converging sides of Westmoreland and D'Olier streets. A peculiar feature of D. is its squares, which are very numerous, spacious, and well kept. Stephen's Green, the largest, occupies nearly 20 acres, and is about a mile in circuit. Somewhat smaller, but more elegant and aristocratic, is Merrion Square (13 acres). The large park and squares of Trinity College occupy more than 40 acres.

The public buildings of D. are famed for number and grandeur, and appear to more advantage since the dwelling-houses are built of brick. In the first class may be mentioned the Bank of Ireland (formerly the house of parliament). Trinity College, the custom-house, and the four courts, which, from the chasteness of their design, and the massiveness of their proportions, have a very imposing effect. The castle has no pretensions to architectural beauty. There are monuments of William III., in College Green (once a *green*, but now a paved street); of Nelson, the Duke of Wellington, Goldsmith, Burke, Grattan, and many others in various public sites. The benevolent and charitable institutions of D. are very numerous and liberally supported.

Within the limits of the Circular road, the Liffey is crossed by nine bridges (two of iron), and through the whole extent of the city the banks of the river are faced with granite walls and parapets. On each side of these 'quays' there is a spacious roadway, with tall houses and excellent shops. The quay proper extends e. from Carlisle bridge.



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Near the custom-house, are several large docks for the accommodation of vessels from distant ports with excisable cargoes, and in communication with the Royal and Grand canals; the former connecting Dublin with the North Shannon and the w. of Ireland, the latter with the s. portion of the same river and the south. A very spacious dock, the 'Spencer dock,' was opened 1873; and the harbor has been much improved in late years by the completion of two large break-waters, the n. and s. walls. There is a bar at the mouth of the harbor, but even there the least depth at low tide is about 11 ft.

The chief manufacture of D. is porter, of which nearly 500,000 hhd. are annually exported, the Guinness brand being the most widely known. Next in order is whisky, and then poplin. These, with some glass-works, cotton and linen factories, foundries, and the work-shops necessary to supply domestic wants, are the main branches of industry. In this regard, D. has been much more of a capital, and less of a manufacturing and export city than London. The direct foreign trade, though increasing, is very limited, Glasgow, Liverpool, and Bristol intercepting the greater portion of it. Much of the inland traffic is carried on by the canals above mentioned, and by the railways (now extending to all parts of Ireland), and consists principally of articles of dairy and farm produce from the central counties. The principal banks are the Bank of Ireland, the Royal, the National, Provincial, Hibernian, and Northern, with some private establishments.

The great educational institution of D. is Trinity College and University: see DUBLIN, UNIVERSITY OF. There is also a Rom. Cath. Univ., the medical school of which has been very successful. The Royal Univ. of Ireland, superseding in 1880 the Queen's Univ., is not a teaching body, but resembles the Univ. of London; it has its seat here. For the humbler classes, much has been done by the national board (whose model schools are attended by large numbers of children), by the Church Education Soc., the Christian Brothers, and Rom. Cath. brotherhoods and sisterhoods, and other agencies. There are many literary and scientific societies, dealing with subjects of general knowledge, or with matters of local or national interest. There are two botanic gardens—one at Glasnevin, belonging to the Royal Dublin Soc., and one near Donnybrook, connected with the university. The hospitals, asylums, orphanages, and other charitable institutions are numerous, and liberally maintained.

The municipal affairs are under the control of a town-council, which consists of a lord mayor, 15 aldermen, and 45 councilors. The city police has charge of the surrounding country as far as eight m. from the castle. The city sends three members to parliament.

The environs of D. are especially beautiful. Rathmines, a southern suburb, has become a large township, and is the favorite residence of the wealthier part of the mercantile community. Glasnevin, on the north, deserves special notice as the favorite residence of the poet Tickell, of



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Addison, Steele, Parnell, Swift, Sheridan, and many other celebrated men. In the cemetery at Glasnevin lie the remains of Curran, O'Connell, and Tom Steele. The Phoenix Park is a magnificent area of nearly 2,000 acres, in some parts level, in others with broken ground, having a large extent of timber and brush-wood, which shelter immense herds of deer. It affords ample scope for military reviews, and is extensively used by the inhabitants of D. of all classes for recreation. D., as a whole, with its magnificent bay—which has often been compared to the Bay of Naples, splendid park, massive public buildings, wide streets, spacious and well-kept squares, clean and elegant quays, and beautiful environs, is one of the most handsome and delightful capitals of Europe.

There are numerous places of worship, Rom. Cath. and Prot., monasteries, convents, friaries, and a Jewish synagogue. The most remarkable among the Protestant churches are St. Patrick's Cathedral, restored by the munificence of a single individual, and Christ Church, which also has undergone restoration; and among the Rom. Cath., St. Mary's, St. Saviour's, St. Augustine's, St. Kivin's.

D. was taken by the Danes in the 9th c., and was practically held by them till the English conquest. James II. held a parliament there in 1689, and William III. occupied it immediately afterwards.

Pop. of municipal borough (1871) 246,326; of whom 195,180 were Rom. Cath., 39,897 Episc., 4,517 Presb., and the rest of other denominations; pop. of parl. bor., 267,717. Pop. of city (1881) 249,602; with suburbs of Rathmines, Glasnevin, New Kilmainham, etc. (1901) 290,638, and about 390,000 in metropolitan police district.

DUBLIN, UNIVERSITY OF: successor of the first university of Dublin, which was established in connection with St. Patrick's Cathedral 1320; but which for want of proper endowments, never prospered, and dragged out a miserable existence till, probably, the dissolution of the cathedral by Henry VIII.

*Foundation and Constitution.*—The existing univ. was founded 1591–2, and is a college with university powers. Trinity College, indeed, was intended merely as the *nucleus* of a univ., but as no colleges have been added, it remains in undisputed possession of all university privileges. Queen Elizabeth provided the charter, the corporation of Dublin bestowed the ground and ruins of the suppressed monastery of All-Hallows, and the Irish gentry supplied by subscription the funds necessary for the erection of the buildings. The income of the college was very limited and very precarious, till James I. endowed it with certain estates in the province of Ulster, and a yearly pension of £388, 15s., English money, from the public purse. By Queen Elizabeth's charter, the corporation was to consist of a provost, three fellows, and three scholars, in the name of more, with the power of purchasing, taking, and possessing any manors, tenements, etc., from the sovereign, or from any other person. On a vacancy in the provostship, the fellows were entitled to elect a fit successor, and the election

of fellows and scholars lay with the provost and fellows. The provost and fellows had full powers to enact statutes, confer degrees, and prescribe the necessary exercises for graduation, and to do all the work of tuition. Defects soon began to show themselves in this constitution, but they were remedied by the new statutes of Abp. Laud, definitely published 1637, and in the main still in force. By these the election of provost was given to the crown.

*Parliamentary Representation.*—In 1613, James I. conferred on the univ. the right of sending two members to the Irish parliament. One of these was taken away at the Union, 1800, but was restored by the Reform Bill of 1832. The electors were formerly the provost, fellows, and scholars; but, in 1832, the privilege was extended to masters of arts, and those of higher degree.

*Management and Officers.*—The provost and senior fellows form the board of management of the college. By letters-patent, 1874, a council of 17 members was established to co-operate with the board in the regulation of studies, and in the appointment and regulation of the duties of professors. The government and working of the univ. are intrusted to the following officers: chancellor, vice-chancellor, provost, two proctors (one chosen from the senior, and one from the junior fellows), a senior lecturer (who regulates the public examinations), two deans, and a censor, a librarian, registrars, an auditor, professors, and examiners. The chancellor (or, in his absence, the vice-chancellor or *pro vice-chancellor*), all masters of arts, and doctors of the three faculties, whose names are on the college books, form the senate of the university. The senate elects the chancellor, and confers degrees. The caput of the senate consists of the chancellor, vice-chancellor, provost (or vice-provost), and senior master *non-regent*, who is chosen by the senate. Every *grace* (for the bestowal of a degree) must first receive the sanction of the provost and senior fellows, be afterward approved of by the caput (each member of which has a *negative* vote), and finally be confirmed by the senate in public congregation. The provost, who is appointed by the crown, may be a layman, of any religious denomination. His income is about £3,000 a year.

*Fellows.*—The fellows are chosen, in the first instance, by examination; but the seniors are promoted from the juniors, in order of seniority. They have no stated duties, except those connected with the general management of the college affairs. The average income of a senior fellow, from all sources, is about £1,380 per annum. The junior fellows are elected by examination. They form the great teaching staff of the college, and do all the duties of lecturing and examining the undergraduates. Most of them are tutors, and their income, which may average £600 a year, is derived partly from a salary given by the college, and partly from their duties as tutors, lecturers, and examiners. Fellowships were formerly tenable only by members of the Episc. Church, but by the recent act all such religious restrictions were abolished. The number of



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the junior fellows has been altered from time to time, but by a queen's letter issued some years ago it was fixed at 23. The law of celibacy, imposed in the reign of Charles I., was repealed 1840.

*Professors.*—There is a very complete staff of professors, who represent almost all subjects of human knowledge. Besides a full complement of lecturers in divinity, nat. philosophy, mathematics, law, and medicine, there are professors of ancient, oriental, and modern languages (Irish, Arabic, and Sanskrit among the number), moral philosophy, oratory, and English literature, modern history, political economy, nat. history, botany, geology, mineralogy, civil engineering, etc.

*Scholars.*—The scholars, 70 in number, are elected from among the undergraduates. They are members of the corporation, and have the univ. franchise. Scholarships (tenable for five years) are gained by public competition—some for classics, others for science; the provost and senior fellows, assisted by some of the junior fellows or professors, if desired, are the examiners. The various emoluments of a scholar, arising from salary, remission of fees, rooms, commons, etc., amount to about £50 per annum. There are also minor scholarships, for the encouragement of the study of divinity and of the Irish language; while others are connected with the royal and endowed schools. Forty exhibitions of £25 per annum each, tenable for two years, have been recently founded, 12 of which are given in each year to students immediately after entrance, and 8 to those who have concluded their second year.

*Students.*—There are four grades of students. 1. Noblemen, sons of noblemen, and baronets, who have certain special privileges; the first two being allowed the degree of B.A. *per specialem gratiam*. 2. Fellow-commoners, who dine at the fellows' table. 3. Pensioners, who form the great body of the students. 4. Sizars, who have rooms and commons free. The sizars are limited to 30; they are elected by competitive examination, and hold their sizarships (worth about £37 per annum) for four years. Each rank has a dress peculiar to itself. Students are admitted to the college after examination in a prescribed course of classics, arithmetic, and algebra, English history and composition, and modern geography. The honor of *first place* at entrance examination is keenly contested; and there are, besides, prizes awarded for excellence in special branches of the entrance course, also for Hebrew.

*Tutors.*—Each student must at entrance place himself under one of the 18 junior fellows who are tutors. These stand to their pupil *in loco parentis*, and have charge of their tuition, though each tutor does not necessarily teach his own pupils.

*System, Degrees, and Fees.*—To proceed to the degree of A.B., a student must keep terms for four years, two terms at least being necessary in each year. Terms may be kept either by residence, and attendance on lectures, or by simply appearing on a stated day in the public hall, and passing a creditable examination in a prescribed course.



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Lectures are delivered on the different subjects of each term examination by the tutors, the honor examiners, and the university professors. Students of the first year are called junior freshmen; those of the second, senior freshmen; of the third, junior sophisters; and of the fourth, senior sophisters. All students must pursue the following course: *first year*, Latin, Greek, mathematics; *second year*, Latin, Greek, mathematics, logic, and metaphysics; *third year*, Latin, Greek, physics, logic, and metaphysics; *fourth year*, Latin, Greek, physics (both mathematical and experimental), astronomy, and ethics. For those who aspire to honors, the course is much more extensive than that for mere *pass*. Term examinations having been duly passed, the student is promoted to the degree A.B. Those students who, at the final ordeal of the fourth year, stand highest in an examination over an extra course, are called (according to merit) senior or junior moderators. These form the first class of graduates, the second being called respondents. The third consists of 'unclassified candidates.' The higher degrees are procurable after the lapse of a fixed number of years, and on the performance of certain exercises, and the payment of fees. For entrance and first half-year the fees are—Noblemen, £60; fellow-commoner, £30; pensioner, £15; sizar, £5, 1s. 3d. Other half-years, £33, 12s., £16, 16s., and £8, 8s.—the sizars being exempt. This does not include rooms and commons. For degrees, the fees for pensioners are—A.B., £8, 17s. 6d.; A.M., £9, 16s., 6d.; LL.B., £11, 15s.; LL.D., £22; B.D., £13, 15s.; D.D., £26; M.B., £11, 15s. M.D., £22.

*Divinity, Medical, and Engineering Schools.*—Connected with Trinity College are schools for medicine and engineering. The Divinity School of the Church of Ireland is also in connection with the university. Graduates in medicine and in engineering must previously graduate in arts. The divinity testimonium is obtained after two years' attendance on lectures, with an examination at the end of each term.

*Studentships.*—In 1859, 14 studentships were founded, worth £100 a year each, tenable for seven years, to encourage graduates in the pursuit of some special branch of study which they may afterward be called on to teach, should they become fellows and lecturers. Two are given every year, and (like every other prize or distinction in the university, not connected with the divinity school) are open to persons of all religious denominations. They are awarded to those candidates at the Degree examination who takes the highest places in science and classics respectively.

The univ. is well equipped for carrying education to a high degree of perfection. The teaching staff is numerous, and in the actual work of tuition, the tutorial and professorial elements are more largely combined than in any other British university. Among the many distinguished men who have gone forth from her halls, are Ussher and Berkeley, Elrington, Lloyd, Magee, Sir W. Hamilton, Romney Robinson, Maccullagh, Archer Butler, Lord Cairns, Burke, Sheridan, Curran, Swift, and Goldsmith.

## DU BOIS—DUBOIS.

**DU BOIS:** borough, Clearfield Co., Penn., on Allegheny valley and Buffalo and Rochester and Pittsburgh rrs., 127 m. e.n.e. from Pittsburgh; a centre for coal-mining and lumbering; 2 banks, 1 daily and 2 weekly newspapers; pop. (1890) 6,149; (1900) 9,375.

**DUBOIS;** *dü-bwâ'*, GUILLAUME, Cardinal: 1656, Sept. 6—1723, Aug. 10; b. Brives-la-Gaillarde, Auvergne, where his father was an apothecary. At the age of twelve, he came to Paris, and entered the college of Saint Michel, as a domestic of the principal. Here he made such good use of his opportunities for acquiring knowledge, that he was selected as tutor to the son of a merchant named Mauroy, and gradually rose till he was tutor to the young Duc de Chartres. Although of an ugly exterior, he contrived, by his mixture of wit and hypocrisy, to win the esteem of the boy's mother, while he gained the unlimited confidence of his pupil, partly through their common love of letters, and partly because he took upon himself the odious office of pander to his vices. His public career commenced after the marriage of his pupil, 1692, with Mademoiselle Blois, a natural but legitimatized daughter of Louis XIV. He then received from that monarch, for his services in bringing about the match, a gift of the abbey of St. Just, in Picardy. He was next attached to the French embassy at the court of London, where he formed important political connections. On his return, he became private sec. to his old pupil; and when the latter (now Duke of Orleans) became regent 1715, D. became virtually the most powerful man in France. The great act of his life was the famous treaty signed at La Haye 1717, Jan. 14, known as the *triple alliance*, between England, Holland, and France. The importance of this act was in its effectual change of the foreign policy of France, in spite of the French princes, in spite of the traditions of Louis XIV., in spite of the dislike of the English king for the Regent, and finally, in spite of Cardinal Alberoni himself, the Spanish minister. In reward for his brilliant dexterity, D. received the office of minister of foreign affairs, and in 1720, on the solicitation of George I. of England, was appointed to the vacant archbishopric of Cambray. In 1721, he obtained the cardinal's hat, and in the following year became prime-minister of France, when his authority seemed unbounded. He died a victim to hard work and the wildest debauchery.

**DUBOIS, JOHN:** 1764, Aug. 24—1842, Dec. 20; b. Paris: Rom. Cath. bp. He was educated in the College of Louis le Grand and the Oratorian Seminary of St. Magloire, ordained by special dispensation 1787, Sep. 22, and appointed asst. rector of St. Sulpice parish and chaplain of the Hospice des Petites Maisons. At the beginning of the French Revolution he fled to the United States, and landed at Norfolk, Va., 1791, Aug., where he was cordially received by Bp. Carroll and others to whom he presented letters from Lafayette. For several years he had charge of Rom. Cath. parishes in Md. and Va., and frequently held religious



## DUBOIS-REYMOND—DUBUQUE.

services in the state capital, Richmond. He founded the college and church of Mt. St. Mary, at Emmettsburg, Md., 1805, was pres. of the former till 1826, and was then appointed bp. of the diocese of N. Y., which included at that time a part of N. J. He erected churches in Albany and Buffalo, a college at Nyack, and St. Vincent de Paul's Seminary at Lafargeville, and when refused the necessary funds for the erection of various religious institutions by his own parishioners, went to Europe and collected a large sum of money for the purpose. He was given a coadjutor 1838, at which time his health began to fail.

DUBOIS-REYMOND, *dü-bwâ'râ-mông'*, EMIL HEINRICH: b. Berlin, 1818, Nov. 7: physiologist. He was educated in the universities of Bonn and Berlin, began studying geology as a specialty, but soon gave it up to apply himself to anatomy and physiology. In 1843 he published the first fruit of his studies of animal electricity, *A Treatise upon the so-called 'Froschstrom' and the Electro-motive Fishes*. In 1851 he was elected a member of the Berlin Acad. of Sciences, and 1867 its perpetual sec.; and 1858 succeeded his teacher, Johannes Müller, as prof. of physiology in the Univ. of Berlin. He has long been esteemed one of the most noted workers in what is known as the physical dept. of physiology. His publications include *Collected Essays upon General Muscular and Nervous Physics* (1875-77), *Darwin vs. Galiani* (1876), *Physiological Inquiries* (1878), *History of Civilization and the Natural Sciences* (1878). He also revised Sach's *Inquiry Concerning the Electrical Eel* (1881), *Speeches* (1886-7). Between 1859 and '77 he edited *Archives of Anatomy and Physiology*, a periodical established by Prof. Müller, and since 1877 has conducted it under the title of *Archives of Physiology*.

DUBOVKA, *dô-bov'kâ*: town of European Russia, govt. of Saratov, on the e. slope of the Sarpa Hills, on the right bank of the Volga; lat. about 49° n., and long. 44° 45' e. It is a dépôt for goods brought from the n. provinces, which it forwards to Katschalinskala, a town about 40 m. distant, on the Don. The produce is thence conveyed on the Don to the s. provinces. D. has some trade in wood, oil, iron; and manufactured articles. Pop. 15,000.

DUBUQUE, *dô-bûk'*: city, cap. D. co., Io.; on the w. bank of the Mississippi river; 199 m. w. of Chicago, 321 m. s. of St. Paul, 470 m. n. of St. Louis; at junction of the Ill. Central, the D. and Sioux City, and the Chicago D. and Minn. railroads; port of entry; oldest and largest city in the state; area 13 sq. m. It was founded by Julian Dubuque, French lead-miner, 1788, abandoned at his death, 1810, and permanently settled 1833. D. is in one of the richest lead regions of the United States; the shipping-point for the mines of Io., Ill., and Wis.; and beside its railroad facilities has steamboat connection with St. Paul and St. Louis. In 1900 it had 460 manufacturing establishments, which employed a capital of \$8,117,358; hands 5,503, paid in wages \$2,012,153, yielded products valued at \$10,952,204. The principal manufactures are white



## DUCAL—DUCAS.

lead, shot, steam-engines, agricultural implements, wooden wares, brick, leather, artificial stone, sash doors and blinds, beer, flour, soap, and candles. It has a handsome marble custom house, an attractive city hall, 3 national banks, cap. \$700,000, 5 state banks, cap. \$750,000, and 5 daily, 9 weekly, and 3 monthly papers. Its educational institutions comprise 18 public schools, a German Presb. Theol. School, a Prot. Episc. seminary, four Rom. Cath. seminaries, several convents, and the Io. Institute of Arts and Sciences. It is the seat of a Rom. Cath. bp., and besides an imposing cathedral has 33 churches—27 Protestant, 6 Roman Catholic. D. has two public parks, is lighted with gas and electricity, is supplied with water by a costly system of water-works and artesian wells, has a liberally maintained public school system, and in addition to its other industries has a large grain trade. It also has a complete ship-building plant, in which considerable work has been done for the new navy. Slaughtering and meat-packing has become an important industry; capital (1890) \$1,758,374. Pop. (1860) 13,000; (1870) 18,434; (1880) 22,254; (1890) 30,311; (1900) 36,297.

DUCAL, a *dū'kāl* [F. *ducal*; It. *ducale*, pertaining to a duke: F. *duc*, a duke—from L. *dūcō*, I lead; *dux*, a leader]: pertaining to a duke. DUCAT, n. *dūk'ăt* [OF. *ducat*—from It. *ducato*]: coin first struck by a duke; one of the most extensively used names for a coin, mostly of gold. Ducats were first coined in the 12th c. in Sicily, and took their name from the legend found on those early Sicilian pieces: *Sit tibi, Christe, datus, quem tu regis, iste Ducatus* (*ducatus* means duchy). Such coins were extensively issued after the 12th c. in Italy, especially at Venice. Venice ducats were called *Zecchini* from *Zecca*, where the mint was situated. The ducat was adopted 1559 by the imperial diet of Germany into the currency of the empire, and was afterward coined in the several German states, and over the whole of northern Europe, Russia included. The coins generally bore the likenesses of the sovereign princes. The ducat varied in weight and fineness; by far the most common, which was current in Austria, Russia, Hamburg, etc., weighed 54 troy grains, sterling value about 9s. 4d. (abt. \$2.20). The modern Italian ducat was of much less value. The gold ducat of Venice was valued at 6s. In the (late) kingdom of the Two Sicilies, the ducat (*ducato del regno*) was a silver coin and money of account, forming the unit of the currency, being divided into 100 grani, in the island of Sicily into 100 bajocchi. There are few silver ducats, however, in existence. This ducat = 3s. 4d. sterling. There are various kinds of the Spanish *Ducado*, generally translated dollar. The *ducado de plata*, or silver ducat, is worth \$1.05. The ducat is now, to a great extent, merely a money of exchange. DUC'ATOON, n. *-tôn*, a coin which varied in value from about \$1 to \$1.37.

DUCANGE: see DUFRESNE, CHARLES.

DUCAS, *dū'kas*, MICHAEL. Greek historian who flourished under Constantine XII., abt. 1450: dates of birth and

## DUCAT—DUCEY.

death unknown. He was a descendant of the family of the emperor Michael VII. After the fall of Constantinople and its occupation by Mohammed II., he was employed in various diplomatic missions by the princes of Lesbos, where he had taken refuge. He remained there till the island was again united to the Turkish empire, when he went to Italy, as is believed, and wrote the history for which he is remembered. It contained an outline of universal chronology and a history of events extending from the reign of John Palæologus I. to the capture of Lesbos, 1462.

DUCAT, etc.: see under DUCAL.

DUCATO, *dō-kā'tō*, CAPE (anciently, *Leukatē*): headland at the s. extremity of a promontory of Santa Maura, one of the Ionian Islands; lat. 38° 34' n., and long. 20° 32' e. Cape D. was in ancient times dreaded by mariners, and the modern Greek sailor still fears the strong currents and the fierce gales which he has to encounter there. A point on the w. side of the *Leucatian* promontory is called *Sappho's Leap*, as it was supposed that here the poetess precipitated herself into the sea. It is a white broken cliff, rising perpendicularly from the water to the height of about 2,000 ft. On its summit stood a temple dedicated to Apollo, the substructure of which still exists.

DUCES TECUM, phrase, *dū'sēz tē'kūm* [L. you shall bring with you]: in law, a writ commanding any person to attend in a court of law, and bring with him all documents, writings, or evidences required in a suit.

DUCEY, THOMAS JAMES: 1843, Feb. 4—————; Rom. Cath. priest: b. Lismore, Ireland. He came to the U. S. in childhood; entered St. Francis Xavier Coll., New York, 1860; studied theol. and was ordained priest 1868. While asst. priest of a New York parish, D. in his sermons denounced the scandals of the municipal govt., and incurred the enmity of 'the ring,' who sought to have him assigned to a charge outside the city. He was active in founding 'lyceums' for young men 1872-80; then erected a church and organized a parish. In nearly every movement for the reform of municipal politics he has taken part. In the controversy between Dr. Edward McGlynn and Abp. Corrigan, which resulted in the excommunication of McGlynn, D. on many public occasions expressed sympathy with the opinions and conduct of the recalcitrant priest. In 1894 his sympathy with the reform movement of Dr. Parkhurst led to his attendance on the sittings of the Lexow committee, so frequently as to lead to an order from Abp. Corrigan forbidding his appearance at these sessions, which he refused to obey.



## DU CHAILLU.

**DU CHAILLU**, *dū shā-yü'*, **PAUL BELLONI**: distinguished traveller b. Paris, 1835, July 31. His father was for many years a merchant trading on the Gaboon (q.v.) river, in w. Africa, and thither Paul was carried when a boy. He lived there for several years, and became familiar with the habits and languages of the natives, thus—as well as in his habituation to the climate—unconsciously preparing himself for the explorations which he was afterward to undertake. In 1842, the French made a settlement and built a fort on the Gaboon. Under the protection of this fort, both the elder and younger Du C. resided and carried on their commercial pursuits for some years. Du C. afterward went to America, where he resided for a number of years, and was naturalized in New York. In 1855, Oct., he sailed from New York to w. Africa, where he spent four years in explorations, travelling, as he himself tells us, about 8,000 m., always on foot, and unaccompanied by other white men. He returned to America, and after subjecting his specimens in natural history and ethnological notes to the examination of the scientific men of New York and Boston, he went to England, and published a volume of travels—*Explorations and Adventures in Equatorial Africa, with Accounts of the Manners and Customs of the People, and of the Chase of the Gorilla, Crocodile, Leopard, Elephant, and other Animals* (Lond. 1861). His travels were in a region lying between n. lat.  $1^{\circ} 30'$ , and s. lat.  $2^{\circ}$ , and extending from the coast to about e. long.  $14^{\circ} 15'$ ; and the work in which he gives an account of them contains very important contributions to geographical, ethnological, and zoological science. Under the first of these heads must be ranked, as of chief importance, the information concerning the Fernand Vas, Ogobai, and Rembo rivers (see OGOBAI, or OGOWÉ), and concerning the mountain chain which, between the equator and s. lat.  $1^{\circ}$ , stretches from w. to e. from the neighborhood of the coast far into the interior of Africa. He made known the existence and described the characteristics and habits of a number of African tribes, among which particular interest attached to his account of the Fans (q.v.), a cannibal tribe, inhabiting a region on the w. side of the coast range of mountains, a little n. of the equator. His contributions to zoology included not only the gorilla and other remarkable apes, some of them previously unknown, but also many new species of mammals and birds. Many of the statements contained in his volume, however, being very extraordinary, it was received with much distrust, and was subjected to very adverse criticism; to which it was the more exposed because the author's journals having been put into the hands of a literary gentleman in the United States to be prepared for the press, separate journeys were mixed up in the narrative, and the chronology was thrown into confusion. Much discussion took place in newspapers and periodicals, and some writers went so far as to assert their belief that Du C.'s stories about the gorilla were entirely fabulous, and that he had never seen the animal alive, but had purchased from natives on the coast the specimens which he brought to England. His descriptions of nest-



building apes also were received with incredulity, and the truth of his account of the cannibal Fans was much doubted. The maps drawn up by Dr. Barth and Dr. Petermann in 1862 moved the positions of all the places which he had visited much nearer the coast than he had stated them, so as greatly to reduce the length of his routes. The general trustworthiness of Du C.'s narrative was, however, maintained by some men of the highest eminence, particularly by Sir Roderick Murchison and Dr. Owen. Du C. resolved to confute his opponents, and vindicate his own reputation, by another expedition to Africa, for which he prepared himself by a course of scientific study, to enable him to make astronomical and other observations, and by acquiring the art of photography. During his first explorations, he had laid down the position of places from compass-bearings only. The substantial accuracy of his observations was, however, in the meantime confirmed by a French government expedition under Messrs. Servat and Griffon du Bellay, which explored the Ogobai river 1862; and Dr. Petermann then reconstructed his map of that part of Africa as Du C. had originally laid it down. His statements also regarding the cannibalism of the Fans were confirmed by Capt. Burton, who himself travelled among them. Du C., however, proceeded on his second expedition. He freighted a small schooner, and sailed in her from England 1863, Aug. 6, carrying with him not only an ample store of scientific apparatus, but also of goods for presents to the natives, or barter with them. He reached the mouth of the Fernand Vas river Oct. 10, and was warmly welcomed by the African chiefs whom he had formerly known; but he sustained a grievous misfortune in the loss of all his scientific instruments and many other valuable articles, through the swamping of the canoe by the surf, as they were being landed from the schooner. He was compelled to send to England for another set of instruments, and to wait till they arrived. Meanwhile, he made several excursions in the neighborhood of the coast, through the almost impenetrable jungle which covers the w. coast regions of equatorial Africa, and had abundant opportunity of confirming his former observations regarding the gorilla. He also had live ones caught and brought to him by the natives. In 1864, Sept., Du C. having received his new supply of instruments from England, started on his expedition for the exploration of the interior. He was attended by a body-guard of ten Commi negroes, in thick canvas trousers, blue woolen shirts, and worsted caps, each man having a blanket to keep him warm at night. There was difficulty, however, in getting leave to set out on the expedition at all. It is the universal rule among the coast tribes of w. Africa to prevent, if possible, all strangers from penetrating into the interior, even if it only be to the next tribe, through fear that the exclusive privilege of trading with that tribe should be lost. A grand *palaver* was held on the subject, and it was at last agreed that Du C. should be allowed, as a special favor, to ascend the Fernand Vas or Ogobai, as his object was not to trade, but to shoot animals, and to bring away

## DU CHÂTELET—DUCHE.

the skins and bones. 'Truly,' the chiefs and councilors said, 'we do not know what Chaillie has in his stomach to want such things, but we must let him go.' Du C. revisited some of the scenes of his former explorations—the Ogobai, the Rembo, and their branches. He suffered great hardships, being sometimes at a loss for food, and his attendants being almost all at one time ill of small-pox, which made fearful havoc among the native population, and exposed him to the dangerous suspicion of having caused it by witchcraft. He found scenes of extreme beauty, scenes of mountain and meadow, hill and pasture-land, groves of plantains, groves of lime-trees remarkable for dark foliage, stately palms, and clear sparkling streams. An unfortunate misunderstanding took place at last between Du C.'s party and the inhabitants of a village which he had reached. A conflict took place, the natives became exasperated, and it was with difficulty that the traveller escaped, being obliged, however, to resign all thought of proceeding further. He reached the mouth of the Fernand Vas river 1865, Sep. 21, and found a vessel there loading for London. He had lost everything but his journals; all the treasures in natural history which he had collected were gone. He brought home, however, his astronomical observations, which have been carefully examined by the most competent persons, and the map of w. equatorial Africa has been made much more complete and correct than before. Du C. did not penetrate, on any of his journeys, much more than 240 m. in a direct line from the coast, but his discoveries have been numerous and important, and among them are about 80 new species of mammals and birds. No one now doubts the right of Du C. to be ranked among the most enterprising and truthful of travellers. The account of his second expedition to Africa is entitled *A Journey to Ashango-Land* (Lond. 1867). His ethnographical observations were published in *My Apingi Kingdom* (1870), and *The Country of the Dwarfs* (1872). He published the *Land of the Midnight Sun* (1881), and *The Viking Age* (1887). In 1901 he left the U. S. for a three years' tour of the interior of Russia, and died in St. Petersburg, 1903, April 30.

DU CHÂTELET: see CHÂTELET-LOMOND.

DUCHÉ, *du-shā'*, JACOB, D.D.: 1737–1798, Jan. 3; b. Philadelphia: first chaplain of the continental congress. He graduated at the Univ. of Penn. 1757, and after studying at Cambridge Univ., England, received from the Anglican bp. of London a license to officiate in the churches of Philadelphia. He opened the session of the first congress 1774, Sep. 7, with such fervent and patriotic invocations that he was officially thanked. In 1775 he became rector of Christ Church, Philadelphia; 1776 July, was again chosen chaplain of congress. In 1777 he urged Washington to abandon the patriot cause in a letter which was sent to congress and afterward published. For this action his property was confiscated, he was declared a traitor, and compelled to leave the country. Returning to England he became



## DUCHESNE—DUCHOBORTZI.

chaplain to the Lambeth orphan asylum, but resumed his residence in Philadelphia 1790.

**DUCHESNE**, *dü-shān'*, **ANDRÉ** (in Latin, Andreas Chesnius, or Duchenius, or Quercetanus): father of French history: 1584, May—1640, May 30; b. at Ile-Bouchard, in the old province of Touraine. He studied at Loudun and Paris. History and geography were his favorite studies, and under Richelieu's ministry he was appointed royal geographer and historiographer. He died from being crushed against a wall by a carriage in a narrow street. His collection of the *Historiæ Francorum Scriptores Coartanei ab ipsius gentis origine ad Philippi IV. tempora* (5 vols., Paris, 1636–49), is particularly important. It was continued from the third vol. by his son, François D. (1616–93, also historiographer), and contains much that may be sought in vain in Bouquet's collection. Of his numerous writings, specially notable are *Historiæ Normannorum Scriptores Antiqui* (Paris 1619); *Histoire Généalogique de la Maison de Montmorency et de Laval* (Paris 1624); and *Histoire Généalogique de la Maison de Vergi* (Paris 1625). The last two throw much light upon the history of France. D.'s industry was extraordinary; he is said to have left more than a hundred folios in manuscript.

**DUCHESSE**, and **DUCHY**: see under **DUKE**.

**DUCHESSE**, *n.*: in *build.*, a roofing slate, in size 24 inches by 16.

**DUCHOBORTZI**: Russian religious sect, of the origin of which nothing is certainly known, and which, though conjecturally referred by Count Krasinski to the Patarenes (see **CATHARI**), cannot be traced beyond the middle of the 18th c., when it was found in different parts of Russia; and its members became exposed to penalties by their refusal to serve in the army. The D. hold the doctrine of the Trinity, and are distinguished chiefly by their holding that human souls existed before the creation of the world, and fell in that former existence, from which the fall of Adam and a continual tendency to fall have proceeded; also by their ascribing hidden meanings to all parts of the Bible, for the knowledge of which they depend on inward light. They are extreme mystics. They reject the use of pictures common in the Russian Greek Church. They observe neither baptism nor the Lord's Supper. In their religious meetings they salute each other with bows and kisses; they pray, sing psalms, and exhort or expound the Scriptures. They are, however, generally very ignorant. On the accession of the Emperor Alexander I., they received complete toleration, and were allowed to settle by themselves on the bank of the Molochna in s. Russia. Here, however, an impostor named Kapustin prevailed on them to receive him as a prophet, taught them the transmigration of souls, and made them believe that he himself was animated by the soul of Jesus Christ; and it appears that, in consequence of disputes arising among them concerning him, great numbers were buried alive, and otherwise put to death by the rest, on which the settlements on the Molochna were broken up 1841, and great part of the people transferred to the provinces beyond the Caucasus.



## DUCK.

DUCK, n. *dūk* [Dut. *duycken*, to bow the head, to sink it under water: Dan. *dukke*, to duck, to plunge: Sw. *dyka*, to dive: Bav. *ducken*, to press down]: a well-known water-fowl, the male of which is called a *drake*—which see; a quick inclination of the head, resembling the motion of a duck's head in water; a game in which a small stone, placed on a larger, is to be hit off by the player at a short distance: V. to plunge or dip among water, and then withdraw, as the head; to bob the head down; to stoop; to bow. DUCK'ING, imp.: N. immersion in water. DUCKED, pp. *dūkt*. DUCK'LING, n. a young duck. DUCK'ER, n. one who, or that which. DUCK-ANT, n. in *zool.*, a species of termites, or white ant, a native of Jamaica. The duck-ants nestle in clusters on trees. DUCK-HAWK, n. in *ornith.*, the moor buzzard. DUCK-MOLE, n.: same as DUCK-BILL. TO MAKE DUCKS AND DRAKES, to throw a stone obliquely on the water so as to strike it, and rebound repeatedly; to squander money as heedlessly as children throwing stones along the surface of water. DUCK-ING-STOOL, a mode of punishment for scolding women, who were placed on a stool, and then let down into the water—some write CUCKING-STOOL, but that seems to have been the name of a different though similar apparatus. DUCK'WEED, a native water-plant floating on the surface of fresh-water lakes and ponds; the various species of *Lemna*, ord. *Arācēæ*—said to be only a corruption of *dikerweed* or *ditchweed*. DUCK-LEGGED, *-lēgd*, short-legged. DUCK'S-BILL BIT, a wood-boring tool adopted to be used in a brace. It has no lip, but the screw-cylinder, which forms the barrel of the tool terminates in a rounded portion whose edge is to form the cutter. DUCK'S-BILL LIMPET, in *zool.*, *Parmophorus*, a genus of gasteropods belonging to the family *Fissurellidæ* (q.v.); large compared with its shell, which is oblong. DUCK'S-FOOT, n., in *bot.*, *Alchemilla vulgaris*, from the shape of the leaf; *Podophyllum*, a genus of ranunculaceous plants. DUCK'S-FOOT PROPELLER, a collapsing and expanding propeller which offers but little resistance in the non-effective motion, but expands to its full breadth in delivering the effective stroke, forming a kind of folding oar, which opens to act against the water when pushed outward, and closes when drawn back at the end of the stroke. The idea was taken from the foot of a duck, and was first tried by the celebrated Bernoulli, afterward by Genevois, a Swiss clergyman, about 1757; then by Earl Stanhope about 1803. It was used on the river Thames about 1830. TO DUCK UP, in *naut.*, to clear or haul a sail out of any position which interferes with the helmsman's view.

DUCK, n. *dūk* [Dan. *dukke*; Sw. *docka*, a doll, a baby: M.H.G. *tocke*, a doll, a term of endearment to a girl]: a pet; a darling: see DOXY.

DUCK, n. *dūk* [Dut. *doek*, linen cloth, canvas: Sw. *duk*; Ger. *tuch*; Icel. *dukr*, cloth]: a kind of plain linen of a coarse heavy make, a canvas highly glazed, used for smock-frocks by English agricultural laborers, and for working-dresses by those employed at smelting furnaces and iron forges; a finer D. is sometimes used for coats, vests, etc.

## DUCK.

**DUCK:** name of a well-known group of water fowl; see **ANAS**. The broader bill, laminated and not toothed, distinguishes the Linnæan genus *Anas* from *Mergus* (including Smews, Mergansers, and the Goosander). In recent ornithological systems, however, it is divided into numerous genera; but three chief groups are usually recognized, corresponding to swans, geese, and ducks of popular nomenclature: see **GOOSE**: **SWAN**. The group to which the name duck is sometimes extended, both by scientific writers and in popular language, is characterized by greater breadth of bill than either the swans or geese. Their food is chiefly animal, while that of both swans and geese is in great part vegetable. Their legs are shorter and placed further backward than those of geese, so that they move with greater difficulty and with a more waddling gait on land, and their necks are shorter than those of geese, and much shorter than those of swans, though in this character there is a considerable difference between different species. There is a very marked difference in plumage between the males and females, which is not the case in any corresponding degree in swans and geese. They exhibit also a peculiar anatomical character in a large dilation of their trachea (windpipe) on each side at its bifurcation. This great group of ducks is subdivided into two sections; one section characterized by a webbed or broadly margined hind-toe, the other by a hind-toe destitute of membrane. These characters are connected with important differences in other respects, and particularly in habits; the ducks of the first section being chiefly oceanic, living more exclusively on animal food, and diving readily and frequently in pursuit of it; while those of the second section are more generally inhabitants of lakes and other inland waters, showing a preference for shallow waters. Those of the first section also have the feet placed further backward than those of the second; those of the second have generally longer wings than those of the first, and a longer neck by which they are adapted for seeking their food by dabbling in muddy shallows, they less frequently dive, and when alarmed generally seek safety by taking wing. Many of both sections are migratory, and spend the summer in arctic and subarctic regions. Not a few of them are common to the n. parts of both the e. and w. continents. Their plumage is remarkably thick, soft, and compact. The tongue, which, unlike that of most birds, is large and fleshy, assists in the selection of food. To the first or oceanic section of ducks belong Scoters, Garrots, Eiders, Pochards, Scaups, Harelds, etc.; to the second section belong Shieldrakes, Shovellers, Musk Ducks, Summer Duck, Pintails, Gadwalls, Teals, Wigeons, Bluewings, etc.—See these titles.

The **COMMON DUCK**, or **DOMESTIC DUCK** (*Anas boschas*), known also in its wild state as the **WILD DUCK** or **MALLARD**, belongs to a genus, or sub-genus, of the second section, characterized by a flattish broad bill, longer than the head, not contracted, nor much dilated, toward the tip, and not much elevated at the base, destitute of a tubercle at the base, the denticulations of the upper mandible (ends of the



laminæ) scarcely projecting beyond the margin, and a short and rather pointed tail of 16 feathers. Even as thus characterized, it includes TEALS (q.v.) which are by some ornithologists constituted into a separate genus. The male (drake, q.v.) of the common duck has the four middle tail-feathers recurved. The deep emerald green of the head and upper part of the neck, the white collar which separates the green from the dark chestnut of the lower part of the neck, and the deep blue iridescent *speculum* of the wing—formed by the outer portion of the outer web of the secondaries—also are marked characteristics of this beautiful bird; the plumage of which exhibits greater brightness of colors—during the breeding season at least—in the wild than in the domestic variety. At the close of the breeding season, the male of the wild duck assumes for a time a plumage more sober, and resembling that of the female; but before winter, the splendid plumage proper to his sex is again acquired. The mallard or wild-duck is widely distributed, being found in the n. parts of Europe, Asia, and America, and extending s. as far as Florida—where it is abundant—and the W. Indies, though in the Old World it is not known as belonging to regions of similar climate. It was formerly much more abundant than now in Britain, the drainage of marshes having apparently tended more than any other cause to the diminution of its numbers. Multitudes of mallards, however, still visit the fen counties of England in winter; and great numbers are taken in decoys, with other *Anatide*, and sent to the London market. See WILDFOWL. Many wild-ducks, however, still breed in Britain, sometimes near the lakes or rivers which they frequent, sometimes in more elevated moorish districts, from which the parents often take opportunity of bringing their very young brood to the lower waters, by swimming down the streams on some occasion of their being swollen by rain, and it is interesting to see the little creatures hurried on, without injury, by the current, and passing along narrow rapids and over waterfalls of considerable height, much as pieces of cork might do, and with as little apparent injury. The nest is composed of grass, intermixed and lined with down, and the eggs are usually 9 to 12 in number.

In a wild state this species always pairs, but under domestication becomes polygamous, and the care of the young is left entirely to the female. The domestic D. was known in England as early as the 13th c. and for a long period has been extensively kept in poultry yards both for its flesh and for its eggs. By careful breeding large size combined with great delicacy of flesh has been attained. Besides the farm-yard D. there are about a dozen distinct breeds kept in this country. Of these the Aylesbury, Pekin, Rouen, and Cayuga are the most valuable. Ducks can be kept in confinement and at a distance from streams or ponds, though at somewhat greater expense than if allowed a wide range and access to a body of water. They need a warm house, and if not allowed to roam a large yard should be provided. As they are not good sitters the eggs should be placed under a hen or artificially hatched. The period of incubation



## DUCK-BILL

is about 28 days. Ducks mature very early. If well fed they can be marketed at ten weeks old, when they will dress at a weight from 8 to 11 lbs. per pair. They require considerable animal food as well as farinaceous.

Other species of *Anas* in N. America are the Black D. (*A. obscura*), similar but dusky, with no white visible; the Green-winged and the Blue-winged Teal; the Cinnamon Teal of the s.w., the male mostly chestnut; the Gadwall or Gray D., speculum white; and the Widgeons, top of the head white. Of other genera are the Shoveller or Spoon-bill, the Pin-tail, the beautiful Wood or Summer D., the Canvas-back (closely resembling the Redhead, but with the dorsal wavy lines broken), the Big Scaup D. (with wavy lines, but the fore parts black), the Lesser Scaup (the sides also with waved lines), the Ring-necked D., the Golden Eye or Garrot, the rarer Barrow's Golden Eye (the white on the wing bisected with black), the puffy-headed Butter-ball or Buffle-head or Dipper or Spirit D., the Old Squaw or Long-tailed D. (with no speculum), the Ruddy D. (mottled silvery-white beneath), etc. See also MERGANSER: EIDER: SCOTER: SURF, D.: ETC.

**DUCK-BILL** (*Ornithorhynchus*, or *Platypus*): genus of *Mammalia* of the order *Monotremata* (q.v.). Only one species is fully ascertained, *O. paradoxus*, or *P. anatinus*. It inhabits the rivers of Australia, Papua, and Tasmania. In the Australian colonies it is generally called **WATER MOLE**. The first descriptions of this singular quadruped were received with incredulity, and even when a stuffed specimen was brought to England, it was suspected to have been ingeniously fabricated. The whole length, including bill and tail, is usually 20 to 23 inches. The body is rather long and compressed, thickly covered with very glossy hair, among the roots of which there is a layer of soft short waterproof felt or wadding. The head is small and round, with small bright eyes, and no external ears, though the internal ears are perfectly developed, and the hearing acute; and instead of the muzzle, mouth, and teeth of an ordinary quadruped, the creature is furnished with a bill like that of a duck, but broader in proportion, near the extremity of the upper mandible of which the orifices of the nostrils are placed. The bill is covered with a leathery membrane. There are no true teeth, but the bill has small transverse laminæ, like the bill of a duck; and at its base, on each side of each jaw, are two horny protuberances without roots or bulbs. The tongue is beset with villousities, does not extend to the extremity of the bill, and bears at its base what has been described as another tongue of a thicker form, and with two little fleshy points in front. The legs are short; the fore-feet each have five toes, with strong burrowing claws, and a connecting membrane for swimming, which extends even beyond the claws, but is capable of being folded back, so as not to impede their use in burrowing. The hind-feet are smaller than the forefeet; they have each five toes armed with claws, and webbed, but the web does not extend beyond the base of the claws. The hind-feet of the

male are armed with sharp spurs, connected with a gland, which are merely rudimentary in the female. These spurs were formerly erroneously supposed venomous. The tail is strong, broad, and flattened, about half as long as the body, covered with longer and coarser hairs, and nearly naked on its under surface. The D. has some peculiarities in common with birds, and some with reptiles; for the anatomical characteristics of the D. and the Echidna, see *Monotremata*. It lives chiefly in the water, and seeks its food by means of its bill in the mud. Its food consists chiefly of aquatic insects, mollusks, and the like; and in confinement, it can be fed on worms, minced meat, or egg, and bread and milk. It makes serpentine burrows of great length—20 or even 50 ft.—in river-banks. One end opens below water; and the highest part of the burrow is enlarged into a kind of nest. The ornithorhynchus was originally reported oviparous, but after 1822 was believed to be ovoviviparous; and it was only at the British Assoc. at Montreal, 1884, that it was announced that it had been definitely ascertained actually to lay real eggs, as also the other Monotremes, the Echidnas. The eggs are inclosed



Duck-Bill or Water-Mole (*Ornithorhynchus paradoxus*).

in a strong, white, flexible shell. The development of the egg (as meroblastic; see DEVELOPMENT) resembles that of the reptilia. The young are suckled from the mother's mammary glands, though there are no external teats; the beak of the young is comparatively short and flexible. The D. is lively and active, and so readily alarmed by the appearance of danger, as not to be easily shot, diving before aim can be taken. It is usually to be seen with only its head above water, under which it can remain for seven or eight minutes. The day-time it spends in the burrow, and feeds at night. The Australian natives dig it out zealously, esteeming it as food. Its voice resembles the growl of a small puppy. It carefully dresses and pecks its fur. When asleep, it rolls itself up into a ball.

**DUCK-CREEK:** water-course of central Australia, largest of the channels which drain into the Darling (q.v.).

**DUCK'ING-STOOL:** apparatus formerly in use in Britain for the punishment of scolding wives. The D. grew



## DUCKING-STOOL

out of the cucking-stool, which was not, as many have supposed, a mere difference of name for the same thing. The cucking-stool of itself did not admit of the ducking of its occupants. It was a simple chair in which the offender



Fig. 1.

Ducking-stool until lately in existence at Broadwater, near Worthing.

was placed, usually before her or his (for the cucking-stool was not so specially for women as the D.) own door, to be pelted and insulted by the mob. In conjunction with another instrument of degradation, however—the tumbrel—the cucking-stool was occasionally used for ducking; but the D. *par excellence* was specially for purposes of immersion. There were various examples of the D. Sometimes

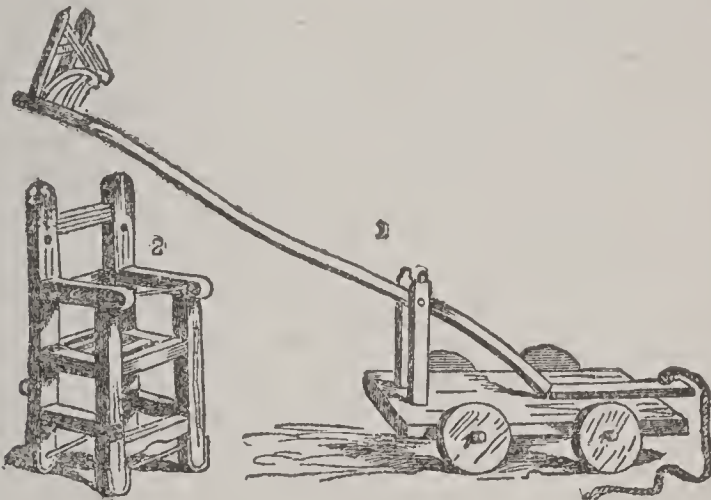


Fig. 2.

1. Tumbrel preserved at Leominster; 2. Ducking-chair in the museum at Scarborough.

it 'consisted of a rough strong chair attached to one end of a beam, which worked on a pivot on a post bedded into the ground at the edge of the dam,' or the river. 'The woman was placed in the chair with her arms drawn backward; a bar was placed across her back and in front of her elbows; another bar held her upright, and there were



## DUCK-WEED—DUCTILE.

cords to tie her securely in. The executors of the punishment then took hold of a chain at the opposite end, and gave her a ducking on the 'see-saw' principle. Fig. 1 is an illustration of this kind of D., which was in use at Broadwater, near Worthing, England. In fig. 2 there is an example of a tumbrel and D. combined, in use for actual ducking at Leominster as recently as 1809. The beam to which the chair was attached was  $23\frac{1}{2}$  ft. in length, the ducking being administered in the manner previously described. A representation of a ducking-chair, preserved in the Scarborough Museum, is also given in fig. 2. Other ducking-stools consisted of an upright and transverse beam, either movable or fixed, from which the chair was suspended by a rope or chain. The practice of ducking commenced in the latter part of the 15th c., and prevailed generally through the kingdom until the first part of the 18th c., and in isolated cases, as we have seen, even into the 19th century.

**DUCK-WEED** (*Lemna*): genus of plants, referred by many botanists to the nat. ord. *Araceæ*, but regarded by others as the type of a small nat. ord., *Lemnaceæ*, which consists chiefly of floating plants, mere flat green fronds, with roots hanging loosely in the water, and unisexual flowers—destitute of calyx and corolla—bursting through a membranous spathe in their margin. The *Lemnaceæ* are distributed through all parts of the world. Several species cover the surface of stagnant ponds with green vegetation. Their flowers and fruit are rarely seen, but they spread rapidly by new fronds budding from their margins.

**DUCORNET**, *dū-kor-nā'*, LOUIS CÉSAR JOSEPH: 1806, Jan. 10—1856, Apr. 27; b. Lille, France: artist. Born without arms, he learned in early childhood to use his feet for hands, and when 13 years old showed such skill in drawing with his toes that Watteau received him as a pupil in the Lille Acad. of Design. There his ambition to become a painter received wholesome encouragement. At the end of 3 years he took the first prize for a drawing of the human figure from life, and received a pension from the city, which the govt. subsequently increased. He then went to Paris for more advanced study, painted *The Parting of Hector and Andromache*, 1828, and presented it to his native city. He continued painting till within a few weeks of his death. His last work of note, *Edith finding the Body of Harold*, was ordered by Napoleon III. and exhibited 1855.

**DUCT**, n. *dūkt* [F. *duit*, a duct—from L. *ductus*, led—from *duco*, I lead]: that which guides or directs; a tube or pipe for conveying a fluid, specially said of vessels of the body; a canal.

**DUCTILE**, a. *dūk'til* [F. *ductile*—from L. *ductilis*, that may be drawn—from *ductus*, led]: easy to be drawn out in length, as wire; that may be extended by beating; malleable; yielding; tractable. **DUCTILITY**, n. *-tī-tī*, property of bodies by which they are capable of being drawn out in length, while diminishing in breadth, without fracture or separation of parts. Ductility is noticeable peculiarly in the

## DUCTOR—DUCTLESS.

case of metals. It is possessed also by gums, glues, resins, and some other bodies, which, when softened by water or heat, may be drawn into threads. Clays, when moistened, become ductile. Metals are ductile, generally speaking, at any temperature, but their ductility is much influenced by temperature; some—brass, for example—are more ductile at ordinary temperatures than when hot. Metals are ductile nearly in the order of their malleability (q.v.), the order of their ductility being as follows, beginning with the highest: gold, silver, platinum, iron, copper, zinc, tin, lead, nickel, palladium, cadmium. Some, however, as iron, are more ductile than malleable. The ductility of gold and glass is surprising; see article **DIVISIBILITY** for an account of the fineness to which gold-gilt silver wire and glass tubes have been drawn. The ductility of glass at red heat seems to have no limit; at high temperatures, this brittle substance may be drawn into threads finer than any hair, and of the highest flexibility. Its flexibility indeed, according to some, increases in proportion to the fineness to which its threads are drawn, and it is conceived possible to convert glass into cloths for wearing apparel. **DUCTILITY**, n. obsequiousness. **DUC'TILELY**, ad. -ly. **DUC'TILENESS**, n. **DUCTILIMETER**, n. *dŭk-tĭl-ĭm'ĕ-tĕr* [Gr. *metron*, a measure]: in *metal.*, an instrument invented by M. Regnier for ascertaining the relative ductility of metals.

**DUCTLESS**, a. [duct-less]: without a duct (q.v.); applied in anat. to the four glands, thyroid, adrenal, thymus, spleen.

## DUCTOR—DUDEVANT.

**DUCTOR**, n., *dŭk'tor* [L., from *ductus*, pp. of *duco*]: a leader; a guide; in *calico-print.*, a gauge or straight-edge to remove superfluous material, as one on the color-roller of a calico-printing machine, inking-rollers, etc. **DUCTOR-ROLLER**, n. in *print.*, a roller to conduct ink to another roller or cylinder.

**DUCTUS**, n. [L., from *duco*, I conduct]: in *anat.* a canal, conduit; *D. ad nasum*, conveying tears into the nose.

**DUD**, n. *dŭd* [Gael. *dud*, a rag; *dudag*, a little rag]: in *OE.* and *Scot.*, a rag; a kind of coarse wrapper. **DUDS**, n. plu. clothing, especially of inferior quality.

**DUDE**, n. *dŭd*: a man devoted to dress and fashion; a fop.

**DUDEEN**, n. [Ir.]: clay tobacco pipe with short stem.

**DU DEFFAND**, *dŭ, dŭ-fōng'*, **MARIE DE VICHY CHAMROND**, Marquise: see **DEFFAND**, **DU**.

**DUDEVANT**, *dŭd-vōng'*, **AMANTINE LUCILE AURORE**, Madame: French authoress, who attained extraordinary celebrity under the name of **GEORGE SAND**: 1804–1876, June 8; b. Paris; descended by the father's side from the famous Marshal de Saxe. Her maiden name was Dupin. After having received a strict conventual education (1817–20), she married M. Dudevant 1822; but in a few years, finding the lack of congeniality of sentiment intolerable, she arranged a separation in 1831, and went to Paris, where at first she was hard pushed to secure a livelihood. Her first literary efforts made their appearance in the *Figaro*. In conjunction with her friend and companion for the time, Jules Sandeau, from whose name she formed her *nom de plume*, she wrote a romance, entitled *Rose et Blanche* (1832), which only occasionally rises above mediocrity, and gave no hint of the splendid ability first fully developed in *Indiana*, published in the same year. This romance, in which a glowing heart, deeply wounded by the pressure of social relations, gives vent to its feelings, excited considerable interest. This was increased to the utmost by the succeeding romances—*Valentine* (1832), *Lélia* (1833), *Jacques* (1834), *André* (1835), *Leone Leoni* (1835), and *Simon* (1836). During the next two years, she published a great variety of works, in which she showed herself deeply influenced by the times in which she was living. In addition to her purely imaginative productions, Madame D. found time to contribute miscellaneous essays and political articles to the journal *Le Monde*, so long as it was edited by Lamennais. She was much occupied at this time with philosophical and theological speculations, and their influence may be traced in the *Spiridion* (1839), and the extraordinary piece of prose poetry, *Les Sept Cordes de la Lyre* (1840). She cherished, moreover, republican ideas of the wildest nature, which appeared conspicuously in the *Compagnon du Tour de France* (1840), and in *Pauline*. Her brilliant literary success having now placed her in comfortable circumstances, she obtained a legal divorce from her husband, and thus secured possession of a portion of the property which she



had brought to him as her dowry. She now occupied herself with the education of her two children, and spent her time, sometimes in Paris, sometimes at her estate in Berri, where she had passed her childhood, or in journeys into Switzerland and Italy. A dispute with the editors of the *Revue des Deux Mondes*, which, 1833-41, had regularly published her works in chapters before they appeared in a separate form, induced her to start the *Revue Indépendante*, in conjunction with P. Leroux and Viardot. For this new review, she wrote *Horace*, *Consuelo*, and *La Comtesse de Rudolstadt* (1842-3), three romances deeply imbued with democratic feelings and sentiments, which are apparent likewise in *Jeanne* (1844), and which in the *Meunier d'Angibault* (1845), are shown as altogether socialistic. Numerous works flowed from her rapid pen between this period and the revolution of 1848, in all of which her socialistic sympathies predominate; but though the logic be not convincing, the vigor and purity of her imagination are undeniable, as always with Madame Dudevant. Even those who disapprove her exaggerated and one-sided ideas and views of life, must admire the perfect form, the captivating style, the plastic finish, and the great affluence of thought and sentiment in all her productions. Her finest romances are *Valentine*, *André*, and, in particular parts, *Consuelo*, her best known work. Of her smaller pieces, *La Mare au Diable*, is a master-piece of its kind, and indeed, from an æsthetic point of view, the most complete production of her pen. After the revolution of February, Madame D. for a short time wasted her talents on the barren politics of the day. She subsequently applied herself to writing plays, which were received less favorably than her novels. In 1854 she published *Histoire de ma Vie*; 1871, *Journal d'un Voyageur pendant la Guerre*; 1873, *Impressions et Souvenirs*. See her *Correspondence* (6 vols. Par. 1881-84), and Miss Thomas's *George Sand* (Lond. 1883).

**DUDGEON**, n *dŭj'ŭn* [W. *dygen*, anger, grudge: comp. Ger. *degen*, a sword]: inward anger or resentment; sullenness; a dagger; the root of boxwood, formerly employed in making handles for daggers—so named from its curious, wavy markings. **HIGH DUDGEON**, in a spirit of sullen indignation; evincing so much resentment as to draw the dagger to be revenged.

**DUDLEY**, *dŭd'li*: parliamentary borough in a detached part of Worcestershire, in the south of Staffordshire, England; 26 m. n.n.e. of Worcester, 8½ m. w.n.w. of Birmingham. It is a well-built town, and a chief seat of the iron trade. On the n.e. of the town are the beautiful ruins of an old castle, founded 760 by Dodo, a Saxon prince. It was demolished in the time of the civil wars of Charles I., was rebuilt, but was burned down 1750. In the vicinity are iron and coal mines, and limestone quarries. The limestone is Silurian and full of organic remains, it is wrought out of caverns, and brought to the kilns by way of a tunnel one mile and three-quarters long, through the basalt of the Castle Hill. Saline springs are near. The chief manufac-

## DUDLEY—DUDLEY LIMESTONE.

tures are fire-irons, grates, nails, vices, chain-cables, other iron utensils, and glass. D. sends one member to parliament. Pop. (1881) municipal borough, 46,233; parliamentary borough, 87,407; (1891) 90,223.

DUDLEY, BENJAMIN WINSLOW, M.D., LL.D.: 1785, Apr. 12—1870, Jan. 20; b. Spottsylvania co., Va., surgeon and lithotomist. He graduated at the Univ. of Penn., 1806; studied with noted surgeons in London and Paris 1810–14; settled in Lexington, Ky.; organized the med. dept. of Transylvania Univ. 1817; became prof. of surgery and anatomy there and delivered 9 lectures each week; and continued in active practice till 1854. He made a specialty of lithotomy, and performed a total of 225 operations with but 6 fatal results.

DUDLEY, *dūd'li*, CHARLES EDWARD: 1780, May 23—1841, Jan. 23; b. Staffordshire, England: merchant. He was educated for a commercial career in London; went to the E. Indies as supercargo; emigrated to the United States 1794; and settled in Albany, N. Y. He became prominent as a merchant and as a democrat in politics, served as state senator 1820–25, mayor of the city 1821–28, and U. S. senator, succeeding Martin Van Buren, 1829–33. He applied the greater part of his leisure to astronomical study. A few years after his death his widow, Blandina D., gave \$70,000 toward founding an observatory in his name at Albany, and subsequently increased the amount to over \$100,000.

DUDLEY, JOSEPH: 1647, Sep. 23—1720, Apr. 2; b. Roxbury, Mass.: lawyer. He graduated at Harvard Univ. 1665, and began studying theology, but soon abandoned it for law. He became a local magistrate 1673; was a commissioner for the New England colonies 1677–81; assisted in negotiating a treaty with the Narragansett Indians 1675; went to England to procure a confirmation of the old charter and failed, but was appointed pres. of New England by the king 1685, and became chief-justice of the supreme court 1687. Subsequently he was arrested and sent to England as a friend of Gov. Andros, but was there received with much favor. He was appointed chief-justice of N. Y. 1690, dep. gov. of the Isle of Wight, 1693, and capt. gen. and gov. of Mass. 1702, serving till 1715.—His son, PAUL D. (1675, Sep. 3—1751, Jan. 21) graduated at Harvard Univ. 1690, became atty.gen. of Mass. 1702, and chief-justice 1745. He founded the Dudleian course of lectures at Harvard, and published a number of essays on the natural history of New England 1720–35.

DUDLEY, THOMAS: 1576–1652, July 31; b. Northampton, England: gov. of Mass. He served with the English army in Holland, joined the non-conformists, came to America as dep.gov. of Mass. 1630, was gov. 1634–40 and 1645–50, and became maj.gen. 1644. Shortly before his death he settled in Roxbury, Mass., where he left a considerable estate. He was father of Joseph D., and father-in-law of Gov. Simon Bradstreet, of Mass.

DUDLEY LIMESTONE: highly fossiliferous Silurian

## DUDLEY LOCUST—DUE.

limestone belonging to the Wenlock Series (q v.), which forms some of the most picturesque eminences around the town of Dudley, England. The masses of corals, shells, and trilobites which abound in this rock, form, when weathered, extremely beautiful cabinet specimens.

DUD'LEY LO'CUST: popular name for a trilobite (*Calymena Blumenbachii*, q.v.), very abundant in the Dudley limestone.

DUDLEY-TRILOBITE: same as DUDLEY LOCUST.

DUE, a. *dū* [OF. *deu*; F. *dû*, *duc*: OF. *deuvre*—from L. *debēre*, to be necessary as a duty, to owe: It. *dovuto*, duty, right: comp. Gael. *duth*, what circumstances warrant]: that ought to be paid or done to another; owing to; fit; proper; that ought to arrive at a certain time specified, as a ship or train; exact or exactly, as due east; seasonable; becoming; capable of being referred to or explained by: N. that which is owed or may be justly claimed; right; just title; a toll or fee. DU'LY, ad. *-lŭ*, properly; fitly; regularly; at the proper time. DUES, n. plu. *dūz*, certain taxes, rates, or payments. DUE'NESS, n. fitness; propriety; suitableness; appropriateness; due quality. DUE'FUL, a. in *OE.*, fit; becoming. DUE-BILL, n. a brief written acknowledgment of indebtedness, differing from a promissory note in not being payable to order or transferable by mere indorsement. OVER-DUE, behind in time or payment. To GIVE THE DEVIL HIS DUE, to give credit even to the worst of men when they deserve it.



## DUEL.

**DUEL**, n. *dū'ěl* [F. *duel*—from It. *duello*—from Lat. (*duellum*, a battle between two (which, as Cicero, *Orat.* 45, says was the old form of *bellum*, war)—from *dŭō*, two]: a battle or combat between two persons with deadly weapons, at a time or place indicated in the challenge by one party, or duly arranged: V. to fight with in single combat. **DU'ELLING**, or **DU'ELING**, imp.: N. the act or practice of fighting in single combat. **DUELLED**, or **DU'ELED**, pp. *dū'ěld*. **DU'ELLIST**, or **DU'ELIST**, or **DUELLER**, or **DU'ELER**, n. one who fights in single combat. **DUELLO**, n. *dū-ěll'ō* [It.]: in *OE*, the rule or law of duelling; a duel.—A duel generally takes place in the presence of witnesses, called seconds, who regulate the mode of fighting, place the weapons in the hands of the combatants, and enforce compliance with the rules which they have laid down.

No trace of the duel, as an institution, is found in the history of the classical nations of antiquity, the Latin word from which ours is derived having been used to signify a war between two nations. So long as men continued barbarians, their personal quarrels were no doubt decided in the ancient world as national quarrels still are in the modern world, by an appeal to physical force. But though war has been in all times the practical solution of strife, it was not till the middle ages that it came to be regarded as a means, in any sense judicial, of settling disputes. Hitherto, it had determined who was able to prevail, justice being set aside; but it was a new view that it would determine who ought to prevail on the principles of justice. The rationale of the *judicial combat* or wager of battle was probably twofold. On the one hand, and generally among the people, it depended on a belief that God would interfere directly and miraculously in the conflict to protect the innocent, and to punish the guilty, and that thus the weakest combatant who had God on his side would prove more than a match for the strongest destitute of His aid. But there was a view of the matter not so directly superstitious, and resting rather on a confusion between the principle of the original constitution of rights and the principle of the transmission of rights. All human rights originate in the powers and faculties which God has given to man, and it was supposed that as the right originated in power, its continued existence in the individual could be ascertained by ascertaining whether the power still existed in him. The error consisted, as we have said, in confounding the principle of the constitution of rights with the principle of the transmission of rights. If a field claimed by two competitors had as yet been appropriated to nobody, or had been abandoned, and was, as lawyers say, *res nullius*, the fact as to which of the two claimants ought to become the possessor might be ascertained by judicial combat. But if it was already the property of one of them on a title which was to be held sacred, and the question was which of the two had this sacred title, that fact could never be determined by ascertaining which would have been in a condition to constitute it for the first time, had it been nonexistent. The principle of the pri-

vate duel, so far as it had any principle at all and was **not** merely a piece of barbarous and irrational foppery, was precisely the same as that of the judicial combat. But the latter had been applied to a class of cases which admitted of legal investigation and decision, and it was consequently abandoned in the days of Queen Elizabeth; whereas the former was supposed to be a means of redressing such wrongs as hardly can come within the cognizance of a human tribunal; and the consequence was that it continued in observance in Britain until recently, and is still in vigor in many continental countries of Europe. In the United States, where it has never been prevalent in the northern states, it has now become so nearly extinct that its occurrence even in the southern states is exceptional.

Like the other peculiarities of mediæval life, the duel originated probably with the Germanic nations. It is said to have been introduced into legal proceedings in lieu of an oath by Gundebald, king of the Burgundians, 501. Louis le Débonnaire was the first of the French kings who permitted litigants to appeal to arms. The practice was prohibited by Henry II., in consequence of a noted duel in his presence between his friend, Francis de la Chastaignerie, and Guy Chabot de Jarnac, in which the latter was slain. The royal edict, however, was totally ineffectual, and the practice of private duelling has generally prevailed more extensively in France than in any other country. Francis I. patronized it by declaring that a lie could be borne without satisfaction only by a base-born churl, and still more by the example which he set in challenging his own great rival Charles V. In 1599, the parliament of Paris declared all persons who were either principals or seconds in duels to be rebels to the king. But its efforts were unavailing; and it is said that during the first 18 years of Henry IV., no fewer than 4,000 gentlemen perished in this foolish manner. In 1609, Henry added to the existing penalties, introducing even punishment by death in extreme cases. But these regulations were forced upon him by popular feeling; he had himself no aversion to the practice, and when he gave permission to Crequi to fight Don Philip of Savoy, he added: 'If I were not the king, I would be your second.' The consequence of this feeling was, that he readily granted pardons to those who had violated the laws which he had been forced to enact, and these laws not unnaturally produced an effect the very reverse of their ostensible object. Duelling acquired the charm of what the French call 'forbidden fruit,' and thus became a fashionable and favorite vice. In the reign of Louis XIII., the custom was so prevalent, that Lord Herbert, the English ambassador, wrote home to his court that there was scarcely a Frenchman worth looking on who had not killed his man. It seems, however, that it was from negligence in enforcing the royal edicts that duelling then reached so alarming a height; for it was during this reign that two noblemen, the greatest duellists of the day, the Count de Boutteville and the Marquis de Beuron, were tried and beheaded for persisting to fight. In the com



mencement of the reign of Louis XIV., duels with four or five on a side began to be fought; and two very sanguinary affairs of this description having taken place, in which several persons of the highest rank were slain, the king determined to put an end to the practice. He published an edict 1679, forbidding it under the highest penalties, which unlike most of his predecessors, he had the firmness to inflict; and this measure, together with a solemn agreement which was entered into among the nobility themselves, led at that time to its almost total abolition.

The duel does not seem to have existed in England in Anglo-Saxon times, and was probably introduced at the Conquest. In its judicial form, it was not entirely obsolete in the reign of Queen Elizabeth; and Sir Henry Spelman gives an account of a trial by battle, which terminated, however, without actual combat, in 1571. See *BATTEL, TRIAL BY*. Private duelling was common both in Elizabeth's reign and in that of her successor, by whom a severe statute against it was enacted in Scotland (1600 c. 12). During the Civil Wars, men's minds were too much occupied with questions of grave importance to leave time for questions of etiquette, and the duel consequently declined; but it became exceedingly prevalent during the dissolute reign of Charles II. Some attempts were made to suppress it in the reign of William III., both in England and in Scotland, and, in 1712, the subject was recommended to the attention of parliament in the queen's speech. But the bill which was brought in by the government was thrown out, and the practice continued to prevail. When the custom of wearing the sword was abandoned, the number of duels diminished, though it was then that their irrational character may be said to have attained its maximum. The pistol was substituted for the sword, and the doctrine of chance—which was reduced to an absurdity by the medical duel of a couple of pills, one composed of bread and the other of poison—was inaugurated. Since this period, the practice has fallen into disrepute, by the gradual operation of public opinion, and in Great Britain it may probably be now regarded as finally abolished. By the law of that country, the act of killing in a duel has always been regarded as murder, however fair the duel may have been; but while the practice was countenanced by public opinion, it was generally found impossible to induce a jury to convict. That a verdict of acquittal could not be looked for with the same security in the present day, is probably a good guarantee against the resort to the duel. In the British army, Articles of War issued 1844, denounced penalties so severe on duelling that it has utterly ceased. In France it still appears to a limited extent. See *ORDEAL: SINGLE COMBAT*.

The duels of the students at the German universities, of which so much has been said and written in this country, are nothing more than fencing-matches with sharp weapons. They are foolish, but not deadly affairs, as the seconds, who are also armed, always interfere to prevent serious bloodshed.



## DUENNA—DUER.

Duelling was introduced into the United States by two servants who undertook to settle a private grievance with deadly weapons in Plymouth, Mass., 1621. The govt. has prohibited it under severe penalties, in the army and navy, where the practice was common in revolutionary days and for many years afterward; and the states generally have enacted strong statutes against it. The killing of Alexander Hamilton by Aaron Burr, 1804; of the great naval hero, Decatur, by his former superior officer, Capt. Barron, 1820; of Congressman Cilley, of Me., by Congressman Graves, of Ky., 1838; and of Charles Dickinson by Andrew Jackson, caused great public excitement, and aroused a strong sentiment against the practice, particularly in the northern states. Though Andrew Jackson had been engaged in a number of duels as principal and second, when he became pres. he attempted to check duelling in the army and navy (where many valuable lives had been lost in the murderous process of affording 'gentlemanly satisfaction' on all manner of pretexts), by dismissing from the navy four officers who had been engaged in affairs of alleged 'honor.' But neither public sentiment, the articles of war, nor the state statutes have been able entirely to prevent the practice, though in the northern states it has become rare. Between 1880-88 several duels were fought in Ky., Va., Md., and S. C., according to the exacting provisions of the ancient 'code of honor.' Like all infractions of law they were arranged and conducted with studied secrecy, yet within a few days they became matters of quite general conversation. The bitterness of political strife expressed in public speech and in the newspaper press have been the most prevalent causes of duelling in modern days. At late as the winter of 1881-2, a southern state presented the spectacle of a noted duellist working with all his energy to induce the legislature to relieve himself and others of the disabilities incurred by duelling, at the very moment when he was a candidate before that body for election to the U. S. senate. Both ambitions were gratified, and he is now (1888) chairman of one of the most important of the senate committees. The state statutes generally provide that when one of the parties in a D. is killed, the survivor is guilty of murder, and the seconds, surgeons, and spectators are accessory to the fact; that fighting a D., even where there is no fatal result, is of itself a misdemeanor; and that any one being directly or indirectly engaged in a D. is forever disqualified from holding public office. In some states a special oath is administered to certain officers that they have not been engaged in any manner in a D. within a specified time, and that they will not be in the future.

DUENNA, n. *dū-ĕn'nă* [Sp. *duena*, fem. of *don*—from L. *domīna*, the mistress of a family]; in *Spain*, an old woman kept to guard a younger one—a governess.

DUER, WILLIAM: 1747, Mar. 18—1799, May 7 He was aide-de-camp to Lord Clive, the gov.gen. of India, 1762; came to the United States 1768; purchased a large tract of land on the upper Hudson river. from which he subse-

quently supplied the British navy with timber for masts and spars; became a judge of co. courts, member of the provincial congress and committee of safety of N. Y., of the committee that drafted the first constitution of the state, and of the continental congress; was sec. of the treas. board 1789; and asst. sec. of the treas. under Alexander Hamilton; and produced a great financial panic by his failure, 1792.—His son JOHN D., (1782, Oct. 7—1858, Aug. 8), became a lawyer, commissioner to revise the statute laws of N. Y. 1825; associate judge of the superior court, and chief-justice 1857; and published several legal works.

DUER, *du'ér*, WILLIAM ALEXANDER: lawyer: 1780, Sep. 8—1858, May 30; b. Rhinebeck, N. Y.: son of William D. He interrupted his study of law by a service as midshipman in the navy under Decatur, 1798; was admitted to the bar 1802; became a partner of Edward Livingston, dist.atty., and mayor of New York; settled in Rhinebeck 1812; was an earnest promoter of canal legislation while a member of the assembly; was judge of the supreme court of N. Y. 1822–29, and was then elected pres. of Columbia College, New York, where he labored with great effectiveness till 1842. A course of lectures delivered by him to the senior class of the college on *Constitutional Jurisprudence of the United States* was published 1833 and revised 1858. After his retirement he delivered several public addresses, and published a life of his grandfather under the title of *Life of William Alexander, Earl of Stirling* (1847).

DUET, n. *dū-ět* [It. *duetto*—from L. *dūō*, two]; a song or air in two parts, for two voices or instruments. DUET'TO, n. *-tō* [It.]: a duet. *Note.*—On the piano, a *duet* is played by two persons at one instrument; in a *dūō*, each of two players has a separate piano.

DUFF, n. *dŭf* [a provincial pronunciation and spelling of *dough*]; in *naut.*, a stiff flour pudding boiled in a bag.

DUFF, *dŭf*, ALEXANDER, D.D., LL.D.: great promoter of and laborer in Indian missions: 1806, Apr. 25—1878, Feb. 12; b. at a farm near Pitlochry, Perthshire, Scotland. He studied at the Univ. of St. Andrews with great success. In 1829 he resolved to go out to India as a missionary from the Church of Scotland; and in Oct. of that year, having been ordained, he set sail from Portsmouth for India. On the passage out, he was wrecked on a barren island n. of the Cape of Good Hope, and at length reached his destination after a disastrous voyage of eight months. At the 'Disruption' in 1843, the missionaries in India being obliged to declare with which party they would connect themselves, D. cast his lot with the Free Church, and for 20 years carried on with great energy the missionary work at Calcutta under the auspices of that body. D. visited his native land twice after 1829, before returning altogether in 1863. He was moderator of the General Assembly of the Free Church 1851 and '73, and was prof. of Evangelistic Theology in the Free Church colleges. He took an important part in various philanthropic societies and schemes. Dr. D. was gifted with great fervor and



## DUFF—DUFFY.

extraordinary fluency as a speaker, and he wrote voluminously. Among his writings are *New Era of the English Language and Literature* (1837), *Missions the Chief End of the Christian Church* (1839), *India and Indian Missions* (1839), *The Indian Rebellion, its Causes and Results* (1858). There is a life of D. by Dr. George Smith (2 vols. 1879).

**DUFF**, n. [local term—origin uncertain]: the *débris* of forest growth, chiefly decayed trunks of spruces, with needles, cones, etc. D. holds water like sponge; when very dry it is easily set on fire, and burns and smokes without flame.

**DUFFEL**, or **DUFFLE**, n. *dŭf'fl* [said to be so called from *Duffel*, in the Netherlands]: a thick, coarse, woolen cloth with a rough nap; a sort of flannel felt.

**DUFFER**, n. *dŭf'fēr* [a mere corruption of *dudder*, a hawker of cheap and flashy goods—from Scot. *dud*, a rag]: a hawker of sham jewelry; a sham of any kind; an awkward person—a slang term.

**DUFFERIN**, *dŭf'ēr-in*, **FREDERICK TEMPLETON HAMILTON BLACKWOOD**, Earl: b. Florence, Italy, 1826, June 24: British statesman. He was educated at Eton and Christ Church, Oxford, where he took his degree; succeeded to his father's title 1841, July 21; was lord in waiting on the queen several years, accompanied Lord John Russell to Vienna 1855, was appointed British commissioner in Syria for the purpose of inquiring into the massacre of Christians there 1860, was under-sec. of state for India 1864–66, and under-sec. for war 1866–7. In 1878, Dec., he was appointed chancellor of the duchy of Lancaster and paymaster-gen., and held the office till 1872, Apr., when he was appointed gov.gen. of the Dominion of Canada. He occupied this post till 1878, Oct., and was succeeded by the Marquis of Lorne. In 1879, Feb., he was appointed ambassador to Russia; 1881, May, was transferred to Turkey; 1882, Oct., assumed control of all British relations with Egypt and the settlement of all questions growing out of Arabi's rebellion; appointed viceroy of India 1884; ambassador to Rome 1888, and to Paris 1892; created baron 1850, nominated a knight of St. Patrick 1863, appointed lord lieut. of the co. of Down 1864, sworn a privy councilor 1868, made an earl of the kingdom 1871, Nov., elected pres. of the Royal Geographical Soc. 1878. May, and created a G.C.B., G.M.S.I., and G.M.I.E., 1884. He had travelled extensively; published *Narrative of a Journey from Oxford to Skibbereen during the year of the Irish Famine* (1848), *Letters from High Latitudes*, an account of his yacht voyage to Iceland (1860), *Irish Emigration and the Tenure of Land in Ireland* (1867), *Mr. Mill's Plan for the Pacification of Ireland Examined* (1868), and *Contributions to an Inquiry into the State of Ireland*; and received the degree LL.D. from Harvard Univ., and the Univ. of Dublin 1879, and D.C.L. from Oxford 1880. He died, 1902, Feb. 12.

**DUFFY**, *dŭf'fi*, **Sir CHARLES GAVAN**: b. Monaghan, Ulster, Ireland, 1816: journalist and statesman. He was educated in Belfast, became sub-editor of the *Dublin Morning Register* 1835, soon afterward editor of an influential



## DUFOIL—DUFOUR

newspaper in Belfast, studied law and was called to the bar, and established the *Nation* in Dublin 1842. This paper was made the organ of the Young Ireland party, attained a large circulation, supported O'Connell, and advocated a repeal of the Union. In 1844 he was tried and convicted of sedition with O'Connell and other leading repealers, but the conviction was set aside by the house of lords on an appeal. Two years later he aided the young Ireland party in establishing the Irish confederation, and, 1848, was tried with Smith O'Brien, Thomas F. Meagher and others for treason—felony, but after four indictments it was found impossible to convict him. He then revived the suppressed *Nation*, defeated his former prosecutor for parliament 1852, was a founder of the Tenant League and the independent Irish party in the house of commons, and resigned his seat and emigrated to Australia 1856. After practicing law in Melbourne, he re-entered political life, was appointed minister of public works in Victoria 1857, minister of lands 1858 and '62, spent two years in Europe, and became prime minister of Victoria 1871. He resigned 1872, was gazetted a knight 1873, re-elected to the legislative assembly 1876, and unanimously chosen speaker 1877, May. He published *Young Ireland: a Fragment of Irish History*, 1840-1850 (Lond. 1880), and a sequel to it, *Four Years of Irish History*, 1845-1849 (1883). D. 1903 Feb. 9.

**DUFOIL**, n. [L. *duo*, two, and *folium*, a leaf]: in bot., a two-leaved flower; an orchid, *Listera ovata*, called Dufoil from having only two leaves.

**DUFOUR**, *dü-fôr'*, GUILLAUME HENRI: Swiss general: 1787-1875; b. Constance, of a Genevese family. While Switzerland formed part of France, he studied at the Polytechnic School of Paris for two years; and on leaving it, received an appointment as officer of engineers in the French army. At the fall of Napoleon, he entered the Swiss service, and rapidly rose to the rank of colonel. When the govt. survey of Switzerland was undertaken, he was appointed director—at the same time acting as principal of the Swiss Military School at Thun. In 1840, he published *A Treatise on the Artillery of Ancient and Mediæval Times*; and in 1842, *A Manual of Military Tactics*. In 1847, he was raised to the rank of general, and intrusted with the command of the army employed against the Sonderbund. He defeated their forces at Freiburg (Nov. 13) and at Lucerne (Nov. 24); and by his prompt and skilful maneuvers, secured a triumph for the liberal party in time to prevent the interference of foreign powers, diplomatically or otherwise. The diet voted him a gift of 40,000 francs, and for a time he was the most popular man in Switzerland. His politics were not, however, those of the Genevese democrats, and in 1848 they deprived him of his public offices. In 1856, he was again admitted to the council of Geneva, and sent on a special mission to Louis Napoleon *à propos* of the dispute between Switzerland and Prussia about Neufchatel (see KERN). In 1864, he was pres. of the Geneva conference.

## DUFRESNE—DUGDALE.

**DUFRESNE**, *dū-frān'*, CHARLES, Seigneur DU CANGE, hence generally styled merely DUCANGE: French historian and linguist: 1610, Dec. 18—1688, Oct. 23; b. Amiens; of an ancient family of Picardy. After having received the rudiments of a scientific education at the Jesuits' College in his native town, he studied law at Orleans, and in 1631 became parliamentary advocate at Paris, where he resided till his death. There was scarcely any branch of science with which he was unacquainted, but his favorite studies were classical philology and history. Among his historical works are the *Histoire de l'Empire de Constantinople sous les Empereurs François* (Paris 1657). He also edited, with other scholars, the *Corpus Historiæ Byzantinæ* (Paris 1680), and Joinville's *Histoire de Saint Louis, Roi de France*. His two principal works are the *Glossarium ad Scriptores Mediæ et Infimæ Latinitatis* (3 vols. fol. Paris 1678; much enlarged by the Benedictines of St. Maur, 6 vols. fol. Paris 1733–36, to which four supplementary vols. were added by Carpentier, a Benedictine), and the *Glossarium ad Scriptores Mediæ et Infimæ Græcitatatis* (Paris 1688). Both works display great learning, good judgment, and admirable industry, and are valuable contributions to the study of the history and antiquities of the middle ages. A new edition of the Latin Glossary was published by G. A. Henschel (7 vols. 4to Paris 1842–53), and a supplementary vol. (*Latino-Germanicum*) was added by Diefenbach (Frankfort 1857); a completely new edition in 10 vols. began to appear 1882. D. left a large quantity of valuable manuscripts, which were collected in the Univ. of Paris.

**DUG**, n. *dŭg* [Sw. *dagga*, to give suck: comp. Gael. *dioghail*, to suck closely: Skr. *duh*, to milk (see DAIRY)]: the teat or pap of a cow or other beast.

**DUG**: pp. of the verb DIG, which see.

**DUGDALE**, *dŭg'dal*, Sir WILLIAM: 1605–1686, Feb. 10; b Shustoke, near Coleshill, Warwickshire: antiquary and historian. He studied at the free school of Coventry, and after the age of 15, under the care of his father. His antiquarian pursuits led to his being created (1638) a pursuivant-at arms extraordinary by the name of Blanche Lyon; and shortly afterward he was made Rouge Croix pursuivant-in-ordinary. During the civil war, D. adhered to the royal cause, and lived for several years in Oxford, employed in researches for his great works. On the Restoration, D. was made Norroy king of arms, and in 1677 Garter king of arms; at the same time, the king, much against the wishes of D., whose estate was but a poor one, conferred upon him the honor of knighthood. He died at his estate of Blythe Hall. His chief works are *Monasticon Anglicanum* (Lond. 1655–61–73), (which, though for the most part written by another antiquary, named Dodsworth, was concluded, arranged, indexed, and corrected by D.); a new and greatly enlarged edition of the *Monasticon* by Bandinel, Caley, and Ellis, was published 1817–30, and re-issued 1846; *The Antiquities of Warwickshire* (1656; second ed. revised and continued 1730); *The Baronage of England* (1675–6); *Origines*



## DUGONG.

*Juridicales, or Historical Memoirs of the English Laws*, etc. (1666; 3d ed. 1680); *Short View of the Late Troubles in England* (Oxford 1681); *The Ancient Usage in Bearing Arms* (1682; new ed. 1811). D. bequeathed upward of 27 folio ms. volumes, written in his own hand, to the Univ. of Oxford. They are now in the Bodleian Library, the Heralds' College, and the Ashmolean Museum.

DUGONG, n. *dū'gōng* [Mal. *duyong*], (*Halicore*): genus of mammalia, of the family *Manatidæ* (q.v.), order *Sirenia*; distinguished by molar teeth with flat summits, and composed of two cones laterally united, the incisors of the upper jaw elongated almost into tusks; the tail forked or crescent-shaped; and the swimming-paws destitute of any vestiges of nails. One species alone has been thoroughly ascertained and accurately described. The D. (*H. Indicus*, or *H. Dugong*) of the Indian Archipelago is said to attain a



Dugong (*Halicore Indicus*).

length of 20 ft. when full grown, although it is more frequently seen 8 to 12 ft. long. It has some resemblance to the seal and the walrus, and in general form it much resembles the manatee. It is called sometimes the sea-cow. The skull is remarkable for the sudden bending downward of the upper jaw almost at a right angle. The upper lip is large, thick, and fleshy, covering the prominent incisors, and forming a kind of snout, 'something like the trunk of the elephant cut short across.' The eyes are very small, and are furnished with a third eyelid or *nictitating membrane*. The skin is smooth and thick, but yields no oil. The anatomy of the D. has been very carefully examined. It exhibits a remarkable peculiarity, in the ventricles of the heart being completely detached from one another. Its osteology has been found to exhibit interesting points of correspondence with that of the *Pachydermata*, as in the numerous ribs, etc.; its dentition resembles in some particulars that of the elephant; its digestive apparatus is adapted to vegetable food, differing very much from that of the whales, dolphins, and other ordinary cetaceans. It feeds on the algæ which grow on submarine rocks in shallow seas. Its lips are of much use in gathering together its



## DUGUAY TROUIN—DUIDA.

food. It often comes to the surface to breathe, and is said to utter a peculiar cry. It is gregarious. The female produces one young one at a birth, and shows an affection for it which is proverbial among the Malays. When the young one is taken, the mother is easily secured. The D. is generally pursued in boats, and killed by spearing. The flesh is highly esteemed even by Europeans, and is described as resembling young beef. That of full-grown animals is, however, comparatively coarse, on which account, and the greater facility of capture, the younger ones are more frequently killed. According to Rüppell, it was with the skin of the D. of the Red Sea that the Jews were directed to veil the tabernacle.

DUGUAY TROUIN, *dü-gā' trô-äng'*, RENÉ: one of the most celebrated naval officers of France: 1673, June 10—1736, Sep. 27; b. St. Malo. He left the school at Caen, where he was to have studied theology, with the reputation of a good-for-nothing fellow, and betook himself to the sea. His career, which was very brilliant, may be divided into two parts, the first 1689-97, the second from 1697 to the close of his life. During the former, he cruised about as a sort of privateer, inflicting immense damage on the enemies of France. The English merchantmen suffered severely from his attacks. In the Channel, on the coasts of Ireland and Holland, in the Spanish Main, everywhere fortune followed Duguay. Louis XIV., as a reward for his daring exploits, admitted him into the state navy, and gave him the command of a frigate. The second part of his career was as brilliant as the first. In 1707, he engaged a part of the English fleet at the entrance of the Channel, burned one ship, captured three others, and about 60 transports; but the most glorious of his triumphs was the attack and capture of Rio Janeiro 1711, after hostilities had lasted for 11 days. The city was ransomed for 610,000 cruzades. The S. American expedition of D. T., which cost Portugal in all about 30,000,000 francs, put the seal to the celebrity of the French commander. He was successively named *chef d'escadre*, member of the council of the Indies, lieut.gen., and naval commandant at Brest. In 1731, Louis XV. sent D. T. into the Levant, to chastise the barbarians inhabiting the neighboring coasts, and to obtain reparation for the damages done to French commerce. In this also D. T. was successful. His *Mémoires* were published by Beauchamps.

DUHAMEL, *dü-há-měł'*, WILLIAM: 1827-1883, Aug. 15; b. Md.: physician. He graduated at the Md. Univ. of Medicine, 1849, was appointed adjunct prof. of surgery in the Georgetown Med. College, 1852, attended all the occupants of the White House during 3 presidential terms, and was chief physician to the U. S. prisons in the D. C. 10 years. He was a member of several medical and scientific societies, and a frequent contributor to professional periodicals.

DUIDA, *dwě'dá:* mountain of Venezuela, S. America; lat. 3° 30' n., and long. 66° 10' w. It is of conspicuous

## DUISBURG.

form, being perpendicular on two sides, and bare at the summit. Height 8,500 ft. It forms a landmark for the voyager on the Orinoco.

DUISBURG, *dō'is-bûrch*: town of Rhenish Prussia, about 15 m. n. of Düsseldorf, in a fertile district, between the Ruhr and the Rhine, with both of which it is connected by a canal. It is surrounded partly by walls, flanked with towers, which are now somewhat decayed, and partly by a rampart and ditches. D. contains a gymnasium founded 1599, a monastery of Minorites, and five churches, two of which—that of St. John the Baptist, dating from 1187, and St. Salvador's, are worthy of notice. Its manufactures are numerous and important; including tobacco, soda, sulphuric acid and other chemicals, iron castings, soap, starch, and sugar; there is also large trade in wine and colonial produce. In the neighborhood are iron-works and coal mines. D. is an ancient town. In the 13th c., it was a member of the Hanseatic League, and afterward a free town of the German empire, but at the close of the war in 1815 it was transferred to Prussia. Pop. (1885) 47,561; (1890) 59,285; (1900) 92,730.

## DUKE.

**DUKE**, n. *dūk* [F. *duc*—from L. *ducem*, a leader—from L. *duco*, I lead: It. *duca*]: a title of nobility of the highest order; a chief; a prince. **DUKE'DOM**, n. the territory, title, or quality of a duke. **DUCHESS**, n. *dŭch'ēs* [F. *duchesse*]: the wife or widow of a duke. **DUCHY**, n. *dŭch'ĭ* [F. *duché*]: the dukedom or possessions of a duke. **DUCAL**, (tc.: see **DUCAL**. **DUKE HUMPHREY**, see under **DINE**.—*Duke* was a term applied originally to any military leader. Gibbon informs us that the title came into use first when Constantine separated the civil and the military commands in the provinces, which had been exercised in common by such men as Agricola. From that time forth, the military governors of provinces, were either counts or dukes. But these titles originally stood to each other in an opposite relation to that which they afterward assumed. 'It should be recollected,' says Gibbon (III. 57, cap. xvii.) 'that the second of these appellations—that of duke—is only a corruption of the Latin word, which was indiscriminately applied to any military chief. All provincial generals were therefore *dukes*, but no more than ten among them were dignified with the rank of *counts*, or companions, a title of honor, or rather of favor, which had been recently invented in the court of Constantine.' See **COUNT**. 'A gold belt,' continues Gibbon, 'was the ensign which distinguished the office of the counts and dukes; and, besides their pay, they received a liberal allowance, sufficient to maintain 190 servants and 158 horses. They were strictly prohibited from interfering in any matter which related to the administration of justice or the revenue; and the command which they exercised over the troops of their department, was independent of the authority of the magistrates.' When the Goths, and Franks, and other barbarians successfully invaded the provinces of the empire, they preserved the titles of count and duke, if they had not already borrowed them from the Romans. But among races who owed their supremacy to the sword, no dignity could prevail over that of the commander of an army; and the dukes, as military chiefs, acquired a marked pre-eminence over the counts, whose lofty functions under the empire had been partly civil, and partly military. The only exception under the first Merovingians was in the case of the Count of the Palace. See **COUNT**. In the hierarchy observed by the Franks and other Teutonic races, the ordinary count became the lieutenant of the duke, and the government of the latter extended to several provinces; whereas that of the former was confined to one province, or even to a single locality. The power of the dukes grew so rapidly, in consequence of the dissensions of the Merovingians, that, toward the end of the sixth c. (582), they arrogated to themselves the right to dispose of the crown. Among the causes which tended to raise the power of the dukes, was the immense wealth which had been acquired by the great provincial families. The chiefs who had attached themselves to the fortunes of Clovis had been richly endowed with conquered lands. After the close of the 7th c., they overshadowed the crown, and the title of



## DUKE.

prince and chief (*chef*) began to be attributed to them. It has been said that the *ducs-maires* of the palace sometimes assumed the title of archduke (q.v.). Under the second dynasty, the title of duke retained all its dignity and importance, and it was to the successive invasions of local upon central power, that feudality owed its origin. The concession, tacit or express, of hereditary power and independent jurisdiction, first to the central province known as the Isle of France, and then to Aquitaine, extended itself, under the Carlovingsians, to Burgundy, Normandy, and Gascony; and on the accession of Hugo Capet, to all the other subaltern tenures. Having become unlimited masters of their respective legations, the dukes did not long delay to proclaim their title to be as good as that of the king. They assumed the crown and the sceptre, promulgated laws for their subjects, struck money with their own image, and made war in their own name against the crown, with whom they balanced and several times divided the supreme authority. The confederation of the feudal lords had assumed such dimensions, that about the period of the Norman invasion of England nothing remained directly under the crown except a few towns, of which Rheims and Laon were the chief. The rest of the kingdom was divided among the dukes and the counts, under an obligation, which they almost always evaded, of service and fidelity to the crown. But the Capetiens had been enlightened by the fall of two dynasties, and were careful to delegate to no other hands the duchy of the Isle of France, which had so often been a stepping stone to the throne. When it became extinct in 887, it was not re-established, and that event was the signal for the restoration of a national character to France. The duchy of Gascony was joined to Aquitaine 1052; and both provinces, with Normandy, were finally re-united to the crown, 1204, by confiscation. This latter duchy was sometimes given to princes of the blood, but without any separation of its fiscal arrangements from those of the kingdom. A part of Aquitaine was given up to England 1259, and ceded back to France 1458. The ducal sovereignty of Burgundy was extinguished 1477, that of Brittany 1514, of Narbonne 1229, and of Toulouse 1361.

The duchies which were subsequently granted to members of the royal family—that of Bourbon, erected 1327; of Orleans, 1344; of Auvergne, Berri, Touraine, Valois, and Alençon, at subsequent periods—enjoyed none of the privileges of independent sovereignty which had belonged to the ancient duchies. The subordination of these fiefs was absolute, and the princes who governed them, though placed on the steps of the throne, were only the first subjects of the realm. The tendency to diminish the actual power which anciently had attached to the ducal title, was still more apparent in the case of those dukedoms which were conferred on the representatives of illustrious noble families. The Montmorencies were created dukes 1551, but they enjoyed no other privileges than those of titled nobles, and their position had no analogy whatever to that

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of the old provincial dukes. The duke-peers, as they were called, were simply the first class of nobles in France, as are dukes in England; but they differed from English dukes, in that, after the extinction of the Comté pairie d'Eu, 1775, the duke-peers alone sat in parliament. Several prelates enjoyed this rank—for example, the abp.-duke of Rheims, the bp.-duke of Laon, and the bp.-duke of Langres. The Abp. of Paris took the same rank after the erection of St. Cloud into a ducal peerage 1674. There were still two other sorts of dukes in France—the dukes who were not hereditary peers, and the dukes for life, or patent dukes, who date only from the reign of Louis XIV. Swept away by the Revolution, the title was restored by Napoleon, who conferred it, with rich endowments, on his marshals. Several ducal peers were created by Louis XVIII. and Charles X.

In Germany, the dukedom passed through phases very similar to those in the earlier history of France. For what is special to the position of the nobility of that country, see GRAF.

Dukes, in the older European sense, do not appear ever to have existed in England. The title seems not to have been known earlier than the reign of Edward III., and from the first it was a mere honorary distinction. The Black Prince, who was created duke of Cornwall (see below) 1335, was the first English duke. In 1350, Henry, the king's cousin, was created duke of Lancaster; and when he died, and his daughter was married to John of Gaunt, the king's son, the title was transferred to him—his elder brother, Lionel, being made duke of Clarence. In the succeeding reign—that of Richard II.—the two younger sons of Edward III. were created, the one duke of York, the other duke of Gloucester. The dignity was thus, in the first instance, confined to the royal house. But the families of Holland and Mowbray very soon received the same title; and one of the Beauforts, an illegitimate son of John of Gaunt, was raised to the peerage by the title of duke of Exeter. In the reign of Henry VI., the title was granted more widely, and there were at one time ten duchesses in his court. The Staffords, Beauchamps, and De la Poles, belong to this period. King Henry VIII. created only two dukes—one his illegitimate son, whom he made duke of Richmond; the other Charles Brandon, who married his sister, the French queen, and was made duke of Suffolk. Queen Elizabeth found only one duke when she came to the throne—Thomas Howard, Duke of Norfolk—attainder or failure of male issue having extinguished the rest of them. After the attainder and execution of the duke of Norfolk, there was no duke in England, except the king's sons, till Ludovic Stuart, a relative of the king's, was made duke of Richmond 1623. In the same year Villiers was made duke of Buckingham. On the Restoration, Charles II. restored the Seymours to the rank of dukes of Somerset, and created Monk Duke of Albemarle. But the habit of conferring this dignity on the illegitimate sons of the monarch was still adhered to, as in the case of the duke of Monmouth, illegitimate son of Charles II.; and



## DUKE OF YORK'S SCHOOL.

the duke of Berwick, of James II. Of the existing dukes besides the descendants of Charles II., there are only three families which date their dukedoms before the Revolution—viz., the Howards, the Seymours, and the Somersets. It was William and Anne who, by advancing a very considerable number of the first families of peers to the rank of duke, altogether changed its character. There are now 11 English dukes, 7 Scotch, 5 of Great Britain, 6 of the United Kingdom, and 2 Irish. These numbers do not include dukes of the blood-royal.

THE DUCAL CORONET is composed of a circle of gold, with eight strawberry or parsley leaves, of equal height above the rim.



Ducal Coronet.

DUKE OF CORNWALL. The duchy of Cornwall was by royal charter of Edward III. conferred on his son Edward the Black Prince. King Henry IV. subsequently included the D. of C. in a patent in favor of his son Henry Prince of Wales. But since that time, the duchy has belonged of right, without any special grant, to the king's heir-apparent from the time of his birth. On the death of the king's eldest son without issue, during the life of his father, the duchy descends to the next brother. In the event of the death of the heir-apparent without issue, and without leaving a younger brother, or in case of the heir-apparent succeeding to the crown, the duchy of Cornwall merges in the crown until the birth of a son calls it again into existence. The uncertainty thus arising in regard to the duchy has produced much confusion in regard to leases held of the duke, and various acts of parliament have been passed, from the 21 James I. to the reign of the present queen, to regulate this matter. The D. of C. formerly possessed 'royal jurisdiction and crown rights, giving liberty to send burgesses to parliament, and appointing the sheriffs, admirals, and other officers.'—Carew's *Cornwall*. At the present day, there is a separate chancellor, and attorney and solicitor-general for the D. of Cornwall. The revenues of the duchy are considerable, arising partly from the rents, etc., of the different manors, and partly from the dues on tin, which is produced in large quantities from the Cornish mines. There is a special court for the settlement of questions arising among the miners, called the Stannaries Court (q.v.).

DUKE OF EXETER'S DAUGHTER: instrument of torture resembling a rack, said to have been invented by the Dukes of Exeter and Suffolk during the reign of Henry VI. This curious instrument was for some time preserved in the Tower of London. Blackstone avers that it was never put into use.

DUKE OF YORK'S SCHOOL: popular designation for the *Royal Military Asylum* at Chelsea. Frederic, Duke of York, 1801, used his influence for the formation of a soldiers orphan asylum; and in 1803, schools were opened for 700 boys and 300 girls, children of deceased soldiers. The institution has been kept up ever since for the boys, of



## DUKHOBORTSI—DULCIANA.

whom 500 are now maintained, but was a failure as to the girls. The boys are wholly supported as well as educated. They are not bound to serve the state after they leave the asylum; but most of them nevertheless enter the army. A soldier's son has not a *right* of admission; a selection is made according as vacancies may occur. When the boys leave the school, those who do not enter the army are apprenticed to trades. The expenses are defrayed by an annual parliamentary grant.

DUKHOBORTSI: see DUCHOBORTZI.

DUKINFIELD, *dū'kĭn-fĭld* or *-fĕld*: township in the n.e. of Cheshire, 42 m. from Chester, separated from Ashton-under-Lyne in Lancashire by the Tame. It has large cotton-factories, iron-foundries, fire-brick and tile-works, and collieries. Astley's New Pit in this township, 690 yards in depth, is one of the deepest coal-mines in the world. Pop. (1881) 16,943; (1891) 17,408.

DULCAMARA, n. *dŭl-kă-mă'ră* [L. *dulcis*, sweet; *amărŭs*, bitter]: hedge-plant, commonly called 'bitter-sweet' or 'woody-nightshade,' so named from its stalks or root when chewed, first tasting bitter, and then sweet; the *Solanum dulcamara*, ord. *Solanaceæ*: see BITTER SWEET: SOLANUM.

DULCAMARIN, n. *dŭl-kă'm'a-rĭn* [Eng. *dulcamara*]: in chem., C<sub>11</sub> H<sub>12</sub> O<sub>5</sub>. An amorphous substance obtained from the stalks of *Solanum dulcamara*. It forms a yellow, transparent, resinous mass, which is sparingly soluble in ether, but readily in alcohol.

DULCAYNAS, n. *dŭl-kă'năs* [Sp.]: the name of a larger sort of oboe, or small bassoon. As it is thought that the instrument was brought into Spain by the Moors, the word may be derived from the same root as the Egyptian Dalzimir, both instruments being of the oboe or reed kind.

DULCE: gulf in Costa Rica on the coast of the Pacific, covering abt. 800 sq. m. Into it empties the small river Dulce.

DULCE, *dŏl'să* or *dŏl'thă*: lake in the republic of Guatemala, Central America, on the e. coast: 30 m. long, 12 m. broad; with 18 ft. of water near the shore and from 30 to 60 ft. in deeper parts. It is connected with the Gulf of Honduras by Golfete lake and D. or Angostura river, and is fed by the Polochic river. The village of Izabal is on the s. bank; and Livingston, named after Edward Livingston of New York, is on the left bank. Vessels drawing less than 6 ft. only are able to pass the bar at the mouth of the D. river.

DULCET, a. *dŭl'sĕt* [OF. *doucet* or *dolcet*, sweet—from L. *dulcis*, sweet]: sweet to the taste or ear; melodious; harmonious. DULCIFY, v. *dŭl'sĭ-fĭ* [L. *faciō*, I make]: to make sweet; to sweeten. DUL'CIFYING, imp. DUL'CIFIED, pp. *-fĭd*.

DULCIAN, n. *dŭl'sĭ an*, or DULCINO, *dŭl-sĕ'nŏ* [It.]. in *mus.*, the name of a species of small bassoon.

DULCIANA, n. *dŭl-sĭ-ă'na* [It.]: in *mus.*, a word now

## DULCIGNO—DULCITANIDES.

applied solely to a soft and delicate-toned organ stop consisting of very small-scale flue pipes. Originally, a dulciana was a kind of hautboy, and these terms are still found on some organ stops; but in some cases the stop is not actually reed, but the pipes by their peculiar shape, narrow at the mouth, and widening gradually toward the top, produce a reedy quality of tone. The dulciana stop was introduced into England, or perhaps invented, by the celebrated organ-builder Snetzler. Stops of this kind are most usual on the choir organ.

**DULCIGNO**, *dŭl'-chĕn'yō* (Slavonic *Mkronich*, Turkish *Olgun*): port of Montenegro, 20 m. s.w. of Scutari, and till 1880 a Turkish town.—*Old D.* fell into the hands of the Turks 1571. In the 16th and 17th c., it was the most famous den of pirates on the Adriatic; but the Turks burned the whole Dulcignote fleet. *New D.* stands a little farther inland. In 1880, with the approval of Turkey, the representatives of the Western Powers arranged that D. and its territories should become Montenegrin, instead of certain inland districts assigned to Montenegro in fulfilment of the Treaty of Berlin. The Albanians (perhaps not quite spontaneously) insisted on the retention of D., and an Albanian League was formed with this view. The dispatch, 1880, Sep., of a fleet representing the Great Powers, did not immediately secure the transfer; it was not till the end of November that, after endless procrastination, the Turks expelled the Albanian troops by force, and the Montenegrins were able to take possession. Pop. abt. 5,000, of whom 3,500 are said to be Mohammedan. D. is the seat of a Rom. Cath. bishop.

**DULCIMER**, n. *dŭl'sĭ-mĕr* [Sp. *dulcemele*—from L. *dulcis*, sweet; Gr. *melos*, a tune or air]: musical instrument resembling a flat box with sounding board and bridges, strung with thin wire; played on by striking the wires with a small piece of wood in each hand.

**DULCIN**, or **DULCINE**: see **DULCOSE**.

**DULCINAN**: see **DULCITAN**.

**DULCINESS**, n. [L. *dulcis*, sweet]: sweetness; softness; mildness; easiness of temper or disposition.

**DULCINIST**, n. *dŭl'sĭn-ĭst* [named after the founder *Dulcinus*]: in *chh. hist.*, one of a sect, followers of Dulcinus, a layman of Lombardy in the 14th c. who taught fantastic doctrines concerning the Trinity. He was burnt by order of Pope Clement IV.

**DULCITAN**, n. [Eng. *dulcite*, and *anhydride*]: in *chem.*,  $C_6H_{12}O_5$ , dulcinan, the anhydride of dulcose, obtained by heating dulcose for some time near  $200^\circ$ , or by boiling it with hydrochloric acid. It is a neutral syrup which volatilizes at  $120^\circ$ , and is reconverted into dulcose by heating it with water and baryta.

**DULCITANIDES**, n. *dŭl'sĭ-tăn-ĭdz* [Eng. *dulcitan*, and suff. *-ide*]: in *chem.*, compounds formed by heating dulcose with organic acids in sealed tubes at  $200^\circ$ . They may be

## DULCITE—DULSE.

regarded as dulcitan in which two or four atoms of hydrogen are replaced by acid radicals.

**DULCITE**, n. *dŭl'sīt*: see **DULCOSE**.

**DULCOSE**, *dŭl'kōs*, or **DULCINE**, *dŭl'sĭn*: substance closely allied to manna-sugar or mannite: brought from Madagascar. It consists of  $C_6H_{14}O_6$ , or  $C_{12}H_{28}O_{12}$ , is insoluble in boiling alcohol, and does not undergo fermentation.

**DULIA**, n. *dŭ-lĭ'ă* [Gr. *douleia*, service, slavery: F. *dulie*]: an inferior worship or service paid to saints—distinguished from *latría*, the worship paid to God. **HYPER-DULIA**, *hĭ'pĕr-dŭ-lĭ'ă* [Gr. *hyper*, over, above]: the worship higher than *dulia*, and less than *latría*, paid to the Virgin Mary.

**DULL**, a. *dŭl* [Goth. *dvals*, foolish: Icel. *dvali*; Sw. *dvala*, giddiness, stupefaction: O.H.G. *dualm*, torpor, sleep: Gael. *dall*, blind, obscure—the primary idea is a stoppage of the faculties or powers proper to the subject]: without spirit; not cheerful; stupid; slow of understanding; slow of hearing or seeing; slow to learn; not bright or clear; dim; obscure; blunt; cloudy. **DULLISH**, a. somewhat or rather dull: V. to make dull; to stupefy; to blunt; to tarnish. **DUL'LING**, imp. **DULLED**, pp. *dŭld*. **DUL'LARD**, n. *-lĕrd*, a person of a slow and heavy understanding; a blockhead: **ADJ.** stupid. **DUL'LY**, ad. *-lĭ*, stupidly. **DUL'NESS**, n. state of being dull; slowness and heaviness of intellect. **DULL-EYED**, *dŭl'ĭd*, having eyes wanting in vivacious expression and intelligence. —**SYN.** of 'dull, a.': dismal; dreary; heavy; sluggish; drowsy; sleepy; lifeless; dead; inanimate; doltish; cheerless; gross; obtuse; tarnished; clouded.

**DULSE**, n. *dŭls*, or **DILSE**, n. *dĭls* [Gael. *duileasg*, seaweed, dulse—from *duille*, a leaf; *uisge*, water—*lĭt.*, the leaf or plant of the water], (*Rhodomenia palmata*): a sea-weed, one of the **CERAMIACEÆ** (q.v.), growing on rocks in the sea, and used as food by the poor on the coasts of Scotland, Ireland, and other northern countries, and of the Grecian Archipelago, occasionally also as a luxury by some who have acquired a taste for it. It has a purple, leathery, or somewhat membranous, veinless, sessile frond, irregularly cut, with repeatedly forked segments, which are either entire at the edges, or furnished with lateral leaflets, the spores distributed in cloud-like spots over the whole frond. Its smell somewhat resembles that of violets. It is eaten raw or roasted, and with vinegar. In Iceland, it is sometimes boiled in milk. It is an important plant to the Icelanders, and after being washed and dried, is stored in casks, to be eaten with fish. In Kamtchatka, a fermented liquor is made from it. It occurs on our coast, and all parts of the British coasts. Sheep are fond of it.—The name Dulse is given in the s.w. of England to another sea-weed, *Iridæa edulis*, also one of the *Ceramiaceæ*, which has an undivided, obovate or wedge-shaped, flat, expanded frond, very succulent, tapering to a short stalk, and of a dull purple color. It is eaten either raw or pinched between hot irons.—**PEPPER DULSE** (*Laurentia minnatifida*), another of



## DULUTH.

the *Ceramiceæ*, has a compressed cartilaginous frond, twice or thrice pinnatifid. It has a pungent taste, and is used as a condiment when other sea weeds are eaten.

DULUTH, *dū-lóth*: city, cap. St. Louis co., Minn.; at the s.w. extremity of Lake Superior; 7 m. n. of Superior City, Wis., 155 m. n.n.e. of St. Paul; 253 m. e. of Moorhead; terminus of the Northern Pacific, D. and Iron Range, St. Paul and D., and Lake Superior and Mississippi railroads; lat. 46° 48' n., long. 92° 6' w. D. is built on the side of a hill which rises gradually from the shore of D. bay to a height of 600 ft. The streets are laid out regularly, and lighted by gas and electricity. The harbor, as now established, is 2,000 ft. wide and 9,240 ft. long, and the dock lines laid down by the sec. of war show 48 m. of front. Adding to this the frontage on the Bay of St. Louis, there are 100 m. of dock front. The U. S. govt. has adopted an elaborate system of improvement for the harbor, which will add greatly to its commercial importance. The inner harbor, or D. bay, is protected naturally by a strip of land known as Minnesota Point, which extends 7 m. into the lake, and has a lighthouse on its extremity, and is entered through a ship-canal 250 ft. wide and 16 ft. deep. The outer harbor is protected by a costly break-water erected by the U. S. govt. Between Minnesota and Rice's points a dike has been constructed, with a passage for vessels, which shuts in D. bay from the obstructions of the 'entry' channel. The inner harbor has a uniform depth of 18 ft. Six regular lines of steamers connect D. with Chicago, Cleveland, and various Canadian and Lake Superior ports, and 5 railroads beside those mentioned are extending branch lines to the city (1888). It has a territory tributary to it as large as Europe with the omission of Russia; is the receiving point of all the coal destined for the northwest; has unrivalled advantages as a mill centre in the rapids of the St. Louis with their fall of 480 ft.; is a natural outlet for a vast lumber region; and is already handling nearly 750,000 tons of iron and copper ore from the great Lake Superior mines annually. In 1886 it received 22,425,730 bushels of grain and shipped 17,981,935 bushels and received 736,000 tons of coal. The cut of the D. lumber dist. for the season 1886-7 was 160,000,000 ft. of lumber, 43,000,000 shingles, and 22,600,000 lath, of which the local mills handled one-third. In a single month, 1886, Sep., 10,000 car loads of grain, or 6,000,000 bushels, were received by the various elevators. Only 36 hours are ordinarily required to take 1,500 tons of cargo out of a vessel and substitute 50,000 bushels of grain. Considering the youthfulness of the city, it has had remarkable growth in commercial importance, due in as large a measure to the energy of its citizens as to the exceptional advantages of its location. It has a blast furnace, numerous machine and car-building works, saw mills, and the usual variety of manufacturing establishments. The cost of new buildings erected 1884 was \$1,626,000; 1885, \$1,500,000; 1886, 2,452,000; 1887, over \$5,000,000. Those of the latter year included a masonic temple, \$100,000; a co. court house,

## DULWICH—DUMAS.

\$40,000; a dry-dock, \$50,000; depot, \$75,000; packing-house, \$50,000; wholesale stores, \$200,000; Standard Oil Company's works to supply the whole northwest, \$100,000; and 1,500 private residences. A chamber of commerce was established, 1866; a board of trade, 1881; and a produce exchange, 1885. Its manufactories in 1900 numbered 433; capital \$8,872,940; employed 3,998 persons; paid \$2,145,444 for wages; \$5,861,499 for materials, had a product valued at \$10,628,957. The city has 25 churches, over 50 miles of elec. street railway, a public library (opened 1890) 30 pub. school buildings, pub. school property valued at nearly \$1,750,000, 3 daily, 10 weekly, and 2 monthly periodicals, a bonded debt (1902) of \$2,664,250, and an assessed valuation of \$26,517,996. Its exports aggregated \$2,351,179 in 1902, imports, \$130,210. In 1895 it had 3 nat. banks (cap. \$1,400,000), 5 state banks (cap. \$825,000), a private bank, and 6 investment and loan companies. D. is named after Jean Duluth, who built a hut there 1760; was first settled on Minnesota Point; dates as a city from 1869; and includes Lake Side and the manufacturing suburb, West D., the latter annexed 1893. Pop. (1869) 38; (1880) 3,643; (1900) 52,969.

**DULWICH**, *dŭl'ij* or *-ich*: suburb of London, in the n.e. of Surrey,  $4\frac{1}{2}$  m. s.s.e. of St. Paul's Cathedral, and near Sydenham. It is a fine rural spot, has many handsome residences, and is noted for its college and picture gallery. Pop. (1871) 4,041; (1881) 5,590; (1891) 6,809.

**DULWICH COLLEGE**, or *God's Gift*, was founded 1619 by Edward Alleyne, a tragic actor. It maintains 12 poor brethren, 12 poor sisters, 12 poor scholars, and 16 out-pensioners. The old college buildings occupy 3 sides of a quadrangle, and comprise the chapel, chaplain's house, alms-rooms, and the Lower School, in which 160 boys receive a second-grade education at the nominal fee of £1 per annum. The Upper School, giving a first-grade education, was, 1870, transferred to new buildings, erected at a cost of nearly £100,000. It can accommodate 700 scholars. The picture-gallery, of choice old Italian, Flemish, and other paintings, was left to the college 1811 by Sir F. Bourgeois, and is much visited. The expenses of this important institution are defrayed chiefly by the revenues of the manor of Dulwich, which consists of about 1,400 acres, and produces about £17,000 per annum.

**DULY**, ad. *dŭ'li* [see DUE]: properly; fitly; regularly.

**DUMANGAS**, *dô-mân'gâs*: a town near the sea-coast, province of Ibilô, island of Panay, one of the Philippines. The vast plains of D. produces rice abundantly. Pop. 25,000.

**DUMAS**, *dŭ-mâ'*, **ALEXANDRE**: a French novelist: 1803, July 24—1870, Dec. 5; b. Villerscotterets; son of the republican gen., Alexandre Davy-Dumas, who was the offspring of the Marquis Davy de la Pailleterie and a negress. The crisp hair and thick lips of D. bore testimony to his African origin, a testimony confirmed by the savage volup.



tuousness and barbaric taste of his partial innumerable compositions. His father died when he was a child, and he had in consequence a very imperfect education. At the age of 20, he came to Paris to seek his fortune, and after a short time received an appointment in the household of the Duc d'Orleans. In 1826, he first appeared as an author in a vol. of *Nouvelles*; but it was not till 1829, when his historical drama, *Henri III. et sa Cour*, was brought upon the stage, that France fairly mistook him for a genius. This work appeared when *Romanticism* was beginning to triumph over *Classicism* in French poetic literature, and was hailed by the advocates of the former as a crowning victory. The Duc d'Orleans, who was delighted with the production, led the applause, on the first night of its representation, in honor of its author. Next morning, D. was made librarian to his highness. From this period, he became more and more a noted character in Paris, dexterously contriving at once to feast the appetites of the mob, and to continue the companion of princes. In 1846, he accompanied the Duc de Montpensier to Spain, as the historiographer of his marriage. Afterward, he visited Africa; and on his return to Paris, finding his income inadequate to meet the expenses of his costly mode of life, he opened a theatre of his own. The Revolution induced him to attempt a political career; but France, in spite of its discreditable admiration of this literary Cagliostro, had sufficient good sense to turn the cold shoulder to him. In 1853, 'financial considerations' compelled him to seek refuge in Belgium. Subsequently, his pecuniary star being once more in the ascendant, D. visited the East. After the conquest of Sicily by Garibaldi, 1860, he followed in the wake of the great Liberator, who does not seem, however, to have been imposed upon by his mountebank worship and bombastic enthusiasm.

It would require pages to enumerate all the productions which have been issued under the name of D.; but for two reasons, this is unnecessary: first, they are for the most part worthless, and secondly, they are for the most part not *his*. Alphonse Karr, in his *Mercantilisme Littéraire* (1845), and M. Eugène de Mirecourt, in his *Fabrique de Romans, Maison A. Dumas et Cie* (1845), have exposed the astounding quackery of this writer. It would seem that D. had introduced the 'sweating-system' into literature, for he had in his employment a large number of poor authors and literary hacks, whose circumstances or position hindered them from demanding a legitimate emolument for their labor. To these persons, D. was in the habit of giving a few brief outlines of a novel or drama, and then paid them for composing the work, which appeared as the production of D.'s miraculous pen. Thus it happened that D. sometimes contrived to issue more volumes in a year than it was possible for a human being to transcribe in the same period. His best known works are *Les Trois Mousquetaires* (8 vols. 1844), *Le Comte de Monte-Cristo* (12 vols. 1841-45), *La Reine Margot* (6 vols. 1845). It would be unfair to deny the brilliancy of some of his own work, especially the dramatic power of



## DUMAS.

his dialogue, or the ingenuity and interest of many of his plots, though the immorality of the story is often portentous; and of his 60 dramas, several deserved permanent success. He earned \$1,500,000 by his pen, but died in miserable poverty. A statue, from a design by Doré, was raised to his memory in Paris, 1883.

DUMAS, ALEXANDRE, or Dumas the Younger: b. Paris, 1824, July 28; son of Alexandre D. He has followed his father in cynical disregard of morals. His principal work is *La Dame aux Camélias* (1848), a novel on which is founded the notorious opera of *La Traviata*. While not without considerable pathos and power, this is one of the weakest and most absurd books that have ever made a great noise in the world. The heroine is a woman of easy virtue, who contrives to keep up an unsullied affection for the young hero, who is a compound of much foolish sentimentalism and imbecility, with some grosser and baser qualities. Among D.'s other works may be mentioned *Le Roman d'une Femme*, *La Dame aux Perles*, and several dramatic pieces. *Le Divorce*, a polemical treatise, appeared 1880. He was installed as a member of the French Acad. 1875. D. 1895,-Nov. 27.

## DUMAS—DUMB.

**DUMAS, JEAN BAPTISTE ANDRÉ:** 1800–1884, Apr. 11; b. Alais, Gard, France: chemist. As a student in Geneva, his chemical and physiological investigations attracted the attention of Decandolle and Prévost. In 1821, he came to Paris, was first a lecturer in the Polytechnic School, then prof. of chemistry in the Athenæum. He was afterward removed to the Sorbonne, and made a member of the Institute. He then abandoned physiology, applying himself to chemical studies, and his views on chemical equivalents, and especially his memoir on the atomic theory, attracted attention over all Europe. His views on the laws of substitutions involved him in a long discussion with the great Berzelius. His researches in organic chemistry, especially his masterly papers on the ethers, on ethereal oils, on indigo, and on the alkaloids, placed him in the first rank of chemists. Chosen a member of the legislative assembly, he held the portfolio of agriculture under the empire, and afterward the office of master of the mint. In 1831, he had been elected a member of the *Académie des Sciences*, and in 1875 he was called to fill the chair of Guizot at the French Academy. He died at Cannes. Numerous contributions from his pen are in the scientific journals and the *Mémoires de l'Académie*. His chief works are *Traité de Chimie appliquée aux Arts*, and *Leçons sur la Philosophie Chimique*.

**DUMASIN**, n. *dū'mās-in* [from *Dumas*, a French chemist, suff. *-in*]: in *chem.*, pyro-acetic oil,  $C_6H_{10}O$ : a colorless volatile oil, boiling between  $120^\circ$  and  $125^\circ$ . It is formed with acetone by destructive distillation of acetates. It forms a crystalline compound with acid sulphites. Strong nitric acid converts it into oxalic acid.

**DU MAURIER**, *dū mō-ré-ā'*, **GEORGE LOUIS PALMELLA BUSSON:** 1834, Mar. 6—1896, Oct. 8: artist; b. Paris, but is a British subject, and, after studying in Paris till he was 17 years old, took a course in chemistry at University College, London, and afterward studied art in Paris, Antwerp, and Düsseldorf. Soon after his return to England, he became noted for the gracefulness and general excellence of his illustrations in various books and periodicals. For many years he has been on the staff of *Punch*, winning recognition as the first society-artist of the time. He has furnished fine illustrations for *Harper's Magazine*. He is an associate member of the Royal Soc. of Painters in Water-Colors. He disdains merely jocose work, and aims at refined satire. There is monotony in his tall, slender figures and a particular type of long, hatchet face; but he defends the figures on the whimsical ground that British stature is increasing. He is author of *Peter Ibbetson* (1891), and *Trilby* (1894), novels with illustrations by himself; and he has illustrated a number of books, including Thackeray's ballads, and *Esmond*; also, *The Story of a Feather*. A vol. of his contributions to *Punch* was compiled 1880, with the title *English Society at Home*, and a collection of his works was exhibited by the Fine Arts Soc. 1885.

**DUMB**, a. *dūm* [Icel. *dumbr*, dumb; *dumba*, darkness: Dan. *dum*, dim, obscure: Ger. *dumpf*, that which has its

## DUMB.

energy kept down, dull: Dut. *dom*, blunt, dull]: mute, silent; unable to speak: V. in *OE.*, to reduce to silence. DUMB'LY, ad. *-lī*. DUMB'NESS, n. state of being incapable of speech; muteness. DUMB AGUE, popular name of intermittent fever (q.v.) in cases in which the usual chill and succeeding fever are either lacking or slightly developed—the disease being thus marked. In some regions the name is given improperly to the far more serious malignant or congestive form of intermittent fever. DUMB-BELLS, weights swung in the hands for exercise. DUMB-CAKE, n. a cake made in silence on St. Mark's Eve with numerous ceremonies, by mails to discover their future husbands. DUMB-CANE (*Dieffenbachia seguina*, formerly called *Arum sequinum* and *Caladium sequinum*), plant of the nat. ord. *Araceæ*, remarkably differing from the plants of that order generally in its almost arborescent character, but agreeing with them in its acridity, which is in none of them more highly developed. It has a cylindrical stem, with ringed scars and oblongo-ovate leaves. It is a native of the W. Indies, and has received its English name from its property of producing dumbness when chewed, its acrid poisonous juice causing an immediate swelling of the tongue, accompanied with excruciating pain. The juice is, however, sometimes used to effect the granulation of sugar. A decoction of the stem is used as a bath and fomentation in dropsy, and the root-stock is used in obstinate constipation. DUMB-CRAFT, n. an instrument somewhat resembling a screw-jack, having wheels and pinions which protrude a ram, the point of which communicates the power. DUMB-CRAMBO, n. a child's game, in which words rhyming to each other are represented in dumb show. DUMB FURNACE, n. a ventilating furnace for mines, so contrived that the foul inflammable air from the more remote parts of the mine shall not be brought in contact with the fire at the mouth of the up-cast shaft. DUMB SHOW, signs and gestures without words. TO STRIKE DUMB, to astonish; to confound; to deprive of the powers of speech through some sudden emotion. DUMB-WAITER, a frame-work made to act between the kitchen and dining room, for conveying food; a piece of furniture for the table, consisting of a revolving series of shelves one above the other, by means of which the various articles required may be easily reached. DUMFOUND, or DUMFOUNDER, v. *dŭm-foun'dēr*, in *familiar language*, to strike dumb; to confuse with sudden astonishment. DUM MY, n. *-mī*, one who is dumb; a representation of a full package or case, meant to deceive; at *whist*, the name of the open hand when three play; a lay figure in the establishments of drapers, clothiers, etc., used to show off articles of clothing, styles of dress, or of dressing hair; a mere sham or imitation; a dumb-waiter; a floating barge connected with a pier; in *eng.*, a locomotive with condensing engines for city travel, and consequently avoiding the noise of escaping steam; in *hat-making*, a tool of box-wood shaped like a smoothing iron, and used by hat-makers in glossing the surface of silk hats; a person who appears on the stage, but has no words to speak.



## DUMB—DUMBARTONSHIRE.

**DOUBLE-DUMMY**, at *whist*, a game with two players, and two open hands. **DUMB'LY**, ad. *-lī*, in *OE.*, mutely; silently.—**SYN.** of 'dumb': speechless; noiseless; voiceless.

**DUMB**: see **DEAF-MUTES**.

**DUMBARTON**, *dŭm-bār'ton*: royal, parliamentary, and municipal burgh, seaport, and chief town of Dumbarton county, mainly on the left bank of the Leven, near its junction with the Clyde, 15 m. n.n.w. of Glasgow. It is rather closely built, and consists chiefly of a long semicircular street, parallel to the river. The chief branches or industry are ship-building, marine-engine and machine making, iron-forging, iron and brass founding, and rope-making. It has regular steam-communication with Glasgow, Greenock, and other Clyde ports. D. is supposed to have been the Roman station Theodosia, and the cap. of the kingdom of the Britons, on the vale of the Clyde. Alexander II., 1222, made it a royal burgh. E. of the alluvial plain at the mouth of the Leven stands the famous and picturesque castle of D., on a steep, rugged, basaltic rock, which is 240 ft. high, a mile in circuit at the base, and forms nearly an island at high water. The rock almost hides the town of D. from the Clyde. The fortress, composed of houses and batteries, studded over the rock, is of considerable historical interest. The rock is accessible only at one part, which is fortified by a rampart. The castle has been often besieged. A huge two-handed sword, said to be that of Wallace, is shown here. D. gave the title of Earl of D. to a cadet of the house of Douglas, and commander of a regt. in the royal cause during the troubles in Scotland in the reigns of Charles II. and James II. Pop. (1881) 14,172; (1891) 16,927.

**DUMBARTONSHIRE**, *dŭm-bār'ton-shēr* (anciently Lennox, Levenax, or Leven's Field): sickle-shaped county in the w. of Scotland, bounded e. by Loch Lomond, Stirling, and Lanark; s., by Renfrew and the Clyde estuary; w., by Loch Long and Argyll; and n., by Perth; 25 m. long, and  $1\frac{1}{4}$  to  $18\frac{1}{2}$  broad, with 35 m. of coast; 264 sq. m. On the e., it has a detached part of 30 sq. m., inclosed by Stirling and Lanark. The s. coast on the Clyde is mostly low and sandy. Loch Long forms 20 m. of the w. border. The Gare Loch, one mile broad and six long, forms, with Loch Long, the Roseneath peninsula in the s.w., studded with beautiful villas. Loch Lomond for 24 m. bounds the e. side of the county, the hills rising from a low, narrow, and wooded shore. Here is the romantic scenery of part of Rob Roy's country described by Scott. The n. of the county is mountainous or hilly, rising in Ben Voirlich 3,092 ft. The scenery of D. is very romantic, and the county forms the route to the West Highlands of Argyll and Perth. The ancient ferry from the Lowlands to the Highlands was between Port Glasgow and Cardross. There are many streams, and nine freshwater lakes, the largest being Loch Lomond. The chief rivers are the Clyde, along the s. border; and the Leven, the outlet of Loch Lomond, and run-

## DUMB-BELL NEBULA—DUMFRIES.

ning six m. into the Clyde at the foot of D. Rock. The mineral products are coal, freestone, limestone, ironstone, and slates. The climate is mild and humid. The chief industries are ship-building and marine-engine making, and bleaching, calico-printing, and dyeing. There are about 75 churches, Established, Free, and United Presbyterian. A portion of the Roman wall of Antoninus runs through the s. e. corner of the county, and ends at Kilpatrick. There are remains of Roman forts, and of a Roman bridge at Duntocher. Stone coffins and Roman vases and coins were found. Pop. (1891) 94,511; (1901) 113,600.

DUMB-BELL NEBULA: n. in *astron.*, a nebula, called also the Hourglass nebula, situated in the constellation Vulpecula.

DUMETOSE, a. *dū'mě-tōs* [L. *dumetum*, a thicket]: in *bot.*, bushy; bush-like.

DUMFRIES, *dūm'frēs* or *dūm-frēz*: royal, parliamentary, and municipal burgh, river-port, and county-town of Dumfriesshire, on the left bank of the Nith, nine m. from its mouth in the Solway Firth, 73 m. s. by w. of Edinburgh. It is irregularly built of red freestone, and is reckoned the cap. of s. Scotland. Two bridges cross the Nith to Maxwelltown, one believed to have been built about 1280, by Devorgilla, mother of John Baliol. It is largely, however, a structure of the 17th c. The most noticeable building is the Mid-steeple, in the centre of the High Street, whose architect was Tobias Bachup, of Alloa. The chief manufactures are woolen cloths (tweeds) and hosiery; and the dye-works have high repute. D. began, it is believed, with the building of a castle, of which nothing remains. The early Scotch and English kings had frequent contests for its possession. About 1200, a monastery was founded here, in the chapel of which Comyn (q.v.) was stabbed by Robert Bruce, 1305. Burns spent the last years of his life here as an exciseman, and the house he resided in, and the mausoleum erected to his memory, are among the most notable objects of the place. Pop. (1891) 24,879. See W. M'Dowall's *History of D.* (2d ed. 1873).

DUMFRIESSHIRE, *dūm-frēs'shēr*: border county of Scotland, on the Solway Firth, having Kirkcudbright on the west. It forms an irregular ellipse, 55 m. by 32, with 22 m. of coast-line on the Solway Firth to which its surface slopes; area, 1,103 sq. m. The n. half is mountainous, rising in several summits 2,200–2,700 ft. The s. part is undulating. The country on the Solway Firth (q.v.) for 10 m. inland is flat, sandy, and gravelly. D. has three beautiful rivers—the Nith, 45m. long; the Annan, 40; and the Esk, 40; dividing the country into three districts or dales called after the rivers. There are many small lochs, three near Lochmaben containing vendace. D. consists of Silurian, Permian, and Carboniferous strata, with eruptions of trap. Tortoise footprints have been found in the new red sandstone of Annandale, at Corncockle. The mineral products are coal, limestone, ironstone, lead, and silver. There are extensive lead mines at Wanlockhead. The climate is moist and mild. There are rich alluvial



## DUMMER—DUMONT.

tracts along the rivers and on the Solway Firth. The Lochar Moss, a peat tract on the Solway Firth, is 13 by 2 to 3 miles, and contains shells, trees, and fragments of ships. The chief occupations are agriculture, and the rearing of cattle, sheep, pigs, and green crops. Sheep-farms occupy the hills. The chief exports are cattle, sheep, grain, wool, hams, and bacon. There are fisheries of salmon in the rivers. D. sends one member to parliament. The county abounds in antiquities. D. formed part of Valentia in Roman times, and subsequently of the kingdom of Strathclyde. Pop. (1871) 74,808; (1881) 76,140; (1891) 74,308; (1901) 72,562.

**DUMMER**, *dŭm'ēr*, **JEREMIAH**: 1680–1739, May 19; b. Boston: author. He graduated at Harvard Univ. 1699, studied theology, and took his doctor's degree at the Univ. of Utrecht. He resided in London as agent of the colony of Mass. 1710–21, became intimate with Bolingbroke, wrote a number of theological and philosophical works while abroad, published a *Defense of the New England Charters* (London 1728), and presented a collection of 800 valuable books to Yale College.—His brother, **WILLIAM D.** (1677–1761, Oct. 10), became lieut. gov. of Mass. 1716, was gov. and commander-in-chief 1723–29, waged a successful war with the Indians, and bequeathed his farm and mansion for the endowment of D. Acad. at Newbury, opened 1763, the first institution of its kind in New England.

**DUMMOW**, *dŭm-mow'*, or **DAMOH**: town of India, division of Jubbulpore, Central Provinces; lat. 23° 50' n., and long. 79° 30' e.; 775 m. w. of Calcutta. It has a large bazaar, and is abundantly provided with wells. Pop. 10,000.

The Dist. of D. has 2,799 sq. m.; pop. about 400,000.

**DUMONT**, *dŭ-mōng'*, **PIERRE ÉTIENNE LOUIS**: 1759, July 18—1829, Sep. 30; b. Geneva: philosopher. He studied theology, and after officiating as a minister for a short time in his native town, went to St. Petersburg 1783, where he accepted the charge of the French Prot. Church. In 1785, he left Russia, went to England, and became tutor to the sons of Lord Shelburne, afterward Marquis of Lansdowne. His superior talents, liberal sentiments, and fine character, soon recommended him to the illustrious Whigs of that period; with Sir Samuel Romilly, in particular, he formed a close friendship. During the early years of the French Revolution, D. was at Paris, where he became greatly attached to Mirabeau, regarding whom he has given the world much important information in his *Souvenirs sur Mirabeau et sur les deux Premières Assemblées Législatives* (not published till 1832, seven years after the author's death). From this work, it appears that D. wrote many of the best articles and speeches attributed to Mirabeau. In 1791, D. returned to England, and formed an intimacy with Bentham. This was certainly the most important event in his life. Deeply convinced of the value of that philosopher's views of legislation, he requested his friend to allow him to arrange and edit his unpublished writings on this subject. Bentham gave him his manuscripts. D. labored



## DUMOURIEZ.

earnestly to abridge, elucidate, correct, and simplify what he had received. The results appeared in his *Traité de de Législation Civile et Penale* (Geneva 1802), *Théorie des Peines et des Récompenses* (Geneva 1810), *Tactique des Assemblées Législatives* (Geneva 1815), *Preuves Judiciaires* (Geneva 1823), and the *Organization Judiciaire et Codification* (1828, posthumous publication). D. returned to Geneva 1814, and became a member of the representative council. He died at Milan.

DUMOURIEZ, *dü-mô-re-ä'*, CHARLES FRANÇOIS: 1739, Jan. 25—1823, Mar. 14; b. Cambrai: French general. He entered the army 1757, and served in Germany during the Seven Years' War. On the conclusion of hostilities 1763, D., who possessed a restless, adventurous genius, went from one country to another, seeking active employment. Under Louis XVI, he held the office of commandant of Cherbourg, where he began a great naval establishment. As the revolution drew on, D. began to attach himself to the popular party. In 1790, he became connected with the Jacobin Club, and during the same year was appointed military commandant of Lower Normandy. After holding for a short time the office of minister of foreign affairs, he became lieut.gen. in the army of the North. The allies were advancing in great force. By a series of bold and rapid maneuvers, D. prevented his enemies from sweeping over the plains of Champagne, and finally took up his position at Grand-Pré. Succors quickly arrived, and the victory of Kellermann at Valmy compelled the invaders to retreat. It is generally admitted that by his admirable strategic movements at this critical period D. saved France. A winter campaign in Belgium followed, and D. overthrew the Austrians under the Duke of Sachsen-Teschen and Clairfait at Jemappes, 1792, Nov. 5, 6. The campaign of 1793, which aimed at the complete conquest of the Netherlands, was opened with the siege of Maestricht; Breda and other places were taken by the French; but at Neerwinde D. sustained a severe defeat from the Austrians under Cobourg. D.'s Jacobinism had been cooling for some time, on account of the anarchy prevailing at Paris, and when commissioners were sent to remonstrate with him on account of his monarchical leanings, he told them nothing could save France from the horrors of anarchy but a constitutional monarchy; D. then entered into secret negotiations with Coburg, evacuated Belgium, and promised to exert himself on behalf of the Bourbon family. He was accused of being a traitor by the authorities at Paris; but when requested by the commissioners to proceed to the capital and stand his trial, he answered by handing over the representatives of the people to the Austrians. He next endeavored in vain to win the army over to his plan of marching upon Paris, and re-establishing the royal authority, and had to take refuge, accompanied by the Duc de Chartres, in the ranks of the enemies of France. The Convention set a price of 300,000 francs upon his head. After wandering through many countries of Europe, he finally settled in England, where he died an exile at Turville

## DUMOUS—DUN.

Park, near Henley-upon-Thames. Besides a multitude of pamphlets, D. wrote *Mémoires du Général Dumouriez* (Hamburg 1796), and *La Vie et les Mémoires du Général Dnmouriez* (3d edit. Paris 1822-24).

**DUMOUS**, *dū'mūs*, or **DUMOSE**, a. *dū-mōs'* [L. *dumōsus*, covered with bushes—from *dumus*, a thorn-bush]: bushy; full of bushes or briars; having a low, shrubby aspect.

**DUMP**, n. *dŭmp* [Gael. *duan*, a song, a poem (see DUMPS)]: in. *OE.*, a tune, usually slow and melancholy; also a dance; a song, whether gay or merry. **MERRY DUMP**, a merry humor.

**DUMP**, v. *dŭmp* [probably from the sound of a blow, from the syllables *dab* or *dub*, a blow; *dab*, a small lump: prov. Sw. *dompa*, to knock, to fall or tread heavily: Icel. *dumpa*; Dan. *dompe*, to plump, as to the ground or into water]: to beat; to strike; to stamp; to unload: N. a blow; an ill-shapen piece; a piece; a bit; a clumsy medal of metal cast in moist sand; a leaden counter; place of unloading; refuse unloaded; in Eng., the sum of one shilling and three-pence. **DUMP'ING**, imp. **DUMPED**, pp. *dŭmpt*. **DUMPAGE**, n. the right or privilege of shooting loads of earth, etc., in any certain spot; the charge or fee paid for such privilege. **DUMPINESS**, n. the state of being dumpy, or thick and short; coarseness and thickness. **DUMPY**, a. *dŭm'pĭ*, made short and thick by a pat or blow, as on a soft material; short and thick. **DUMPY LEVEL**, instrument for levelling short distances, having its compass underneath, and a short telescope with wide field. **HUMPTY**, n. or **HUMPTY DUMP-TY**, n. *hŭm'tĭ-dŭm'tĭ*, a short, thick person. **DUMP'LING**, n. *-lĭng*, a short, thick pudding, usually cooked by boiling. **DUMP-BOLT**, n., in *ship-build.*, a short bolt driven in to hold planks temporarily, until the through-bolts are driven. **DUMPING-CART**, n. a cart having a bed hinged to the axle and capable of being tipped to discharge its load. **TO DUMP ABOUT**, to move about with short steps.

**DUMPS**, n. plu. *dŭmps* [Dut. *domp* or *damp*, a vapor. Ger. *dumpf*, damp, musty]: sulkiness; pettishness; gloominess; sullenness; low spirits; melancholy. **DUMP'ISH**, a. sullen; dull. **DUMP'ISHLY**, ad. *-lĭ*. **DUMP'ISHNESS**, n. **IN THE DUMPS**, in a pettish, sullen temper; out of spirits. *Note.*—This word refers to the old medical theory which ascribed affections of the mind to corresponding diseases of the body, said to have been caused by vapors from the stomach entering the brain.

**DUN**, n. *dŭn* [imitative of droning sound: Icel. *duna*, to thunder: W. *dwn*, a murmur: AS. *dunung*, a noise]: an importunate creditor or visitor: V. to urge for payment of a debt; to call or ask for frequently. **DUN'NING**, imp. importuning. **DUNNED**, pp. *dŭnd*: see **BUMBAILIFF**.

**DUN**, a. *dŭn* [Gael. *donn*; W. *dwn*, brown, dusky: Gael. *duin*, to shut close: Manx, *doon*, to darken]: of a grayish-brown or dark cream color; gloomy: V. to cure fish, as cod-fish, so as to give them a dun color. This is effected by laying them in a pile, after salting, in a dark apartment covered

## DUN—DUNBAR.

with salt, grass, or other like substance. In two or three months they are opened, and then piled again in a compact mass for two or three months longer, when they are fit for use. **DUN NISH**, a. -*nish*, a little brown in color. **DUN'-STONE**, n. a term applied to certain magnesian limestones of a dun or cream color, extremely hard, and rich in lead and calamine. **DUN-FISH**, n. codfish cured by dunning.

**DUN** [see **DUNE**]: verbal root common to the Celtic and Gothic languages, signifying a hill or height. Besides giving rise to the Fr. *dunes*, Ger. *dünen*, Eng. *dunes* (q.v.) and *downs* (q.v.), it enters extensively into the names of places (becoming often *dun*, *don*), as *Dunkirk*, *Dumbarton*, *Donegal*. It is allied to the Ang.-Sax. *tun*, *ton*, whence *town* (q.v.).

**DÜNA**, *dū'ná*, or **DWINA**, *dwē'ná*, or **DVINA**, *dvē'ná*, (known as the Western D. in distinction from the Northern: see **DWINA**, **NORTHERN**): river of Russia, which rises in the govt. of Tver, in the neighborhood of the source of the Volga, and flows w.s.w. in a course almost parallel to that of the Dnieper. At Vitebsk, the D. turns to the w., then to the n.w., and advances in that direction toward its debouchure in the Gulf of Riga, passing the towns of Disna, Drissa, Düna, Jacobstadt, and Riga; length about 650 m. It is navigable from Dünamunde, at its mouth, to Velij, on the border of the govt. of Smolensk—400 m.; but the navigation, owing to its shallows, its rock-obstructions, and sand-banks, is extremely difficult and dangerous, except during the spring and autumn floods. The basin of the D. is estimated at 28,350 sq. m.; at Riga, its breadth is 2,400 ft. In the spring, the surface of the D. is covered with rafts and planks, floated down from the forests of the provinces through which it flows. Its waters, which abound in fish, are connected with those of the Dnieper by means of the Beresina canal, which thus connects the Black Sea and the Baltic.

**DÜNABURG**, *dū'ná-bâr'h*: strongly fortified town of w. Russia, on the Düna, in the govt. of Witebsk. It is of great military importance, owing to the strength of its fortifications, and was formerly cap. of Polish Livonia. It has three fairs in the year, and considerable trade. Pop. (1880) 52,261 (1896) 69,033.

**DUNBAR**, *dūn-bâr'*: royal, parliamentary, and municipal burgh, and very ancient seaport and town in the n.e. of Haddingtonshire, Scotland; on an eminence at the mouth of the Firth of Forth, 29 m. e.n.e. of Edinburgh. Pop. (1891) 3,295. The coast near D. consists of basaltic rocks and islets, and gives fine views of the Bass Rock, the Isle of May, and Fifeshire. D. is a fine old town. It has a sail-cloth and cordage manufactory, a paper mill, and extensive tile-work, breweries, etc., but the chief industry is the fisheries, in connection with which are large curing establishments. The old harbor is impeded at the entrance by craggy islets and sunken rocks, but is accessible to vessels of 300 tons. About 1840, an additional harbor, called the



## DUNBAR.

Victoria Harbor, was erected at D., at the expense of the Fishery Board and town; with recent important repairs and improvements, it has cost altogether upward of £50,000. It has four ft. depth at low water, and is considered one of the best suited for fishery purposes in the country. From 4,000 to 5,000 tons of herrings are annually exported from D., besides what are used for local consumption. The other exports are chiefly corn and potatoes. On the high rocks at the entrance to the new harbor are a few fragments of the ruins of a castle, which, from the end of the 11th c., was the chief seat of the ancient Earls of March, and had great strength and importance as a security against English invasions: Edward I. took it, and Edward II. fled thither after the battle of Bannockburn; it was demolished 1333, and rebuilt 1336; it was successfully defended in a siege of six weeks against the Earl of Salisbury by Black Agnes, Countess of Dunbar, 1338; it sheltered Queen Mary and Bothwell 1567; and in the same year it was destroyed by the Regent Murray. In 1650, Cromwell, at the 'Race of Dunbar,' defeated the Scottish army under Leslie.

DUNBAR, *dŭn-bâr'*, WILLIAM: prob. abt. 1460—prob. abt. 1520: greatest of the old Scottish poets. In 1475, he went to St. Andrews, where, 1477, he took the degree B A., and 1479 M.A. Obscurity rests upon his career for about 20 years after he left the university. From his own writings, we learn that he entered the order of St. Francis, and was employed as an itinerant or preaching friar. In that capacity, he 'ascended the pulpit at Dernton and Canterbury, and crossed the sea at Dover, and instructed the inhabitants of Picardy.' He appears to have entered the king's service, and to have been retained as 'clerk' or sec. to some of James's numerous embassies to foreign courts. In 1500, he obtained from the king a yearly pension of £10. In 1501, he visited England, in the train, as his biographers suppose, of the ambassadors sent thither to conclude negotiations for the king's marriage. 1503, May 9, three months before the queen's arrival, he composed in honor of the event his most famous poem, the *Thrissil and the Pois*. He seems then to have lived chiefly about court, writing poems, and sustaining himself with hope of preferment in the church. 1504, Mar. 17, he received a gift for saying mass for the first time in the royal presence. At Martinmas, 1507, his pension was doubled, and three years afterward, it again received augmentation. He is supposed to have visited the n. parts of Scotland 1511, May, in the train of Queen Margaret. After the ruinous defeat at Flodden, and the confusion consequent on the king's death and a prolonged regency, D.'s name disappears altogether.

As a poet, he had a wonderful variety of gifts; his genius comprised the excellences of many masters. He is at times as rich in fancy and color as Spenser in the *Faery Queen*; as homely and shrewd and coarse as Chaucer in the *Miller's Tale*; as pious and devotional as Cowper in his *Hymns*; and as wildly grotesque in satire as Burns in his *Death and Dr. Hornbook*. When Scott read portions of his works to Crabbe, in Edinburgh, the latter remarked that, 'before the

## DUN-BIRD—DUNCAN.

Ayrshire plowman, Scotland possessed at least one great poet.' A careful edition of D.'s works, by Dr. David Laing, was published 1834; another by John Small, M.A., 1884; also a German one, with life, by Schipper (1884).

**DUN-BIRD**, n.: the pochard or poachard, *Fuligula f. rina*.

**DUNBLANE**, *dŭn-blān'*: city in the s. of Perthshire, Scotland, picturesquely situated on the left bank of the Allan, on the Scottish Central railway, 5 miles n. of Stirling. It takes its name from St. Blane, a bishop of the 7th or 8th c., said to have been born in Bute. It mainly consists of one street of old-fashioned houses. The cathedral of D., chiefly in the First-pointed or Early English style, about 1240, is now in ruins, except the choir, used as the parish church, 80 by 30 ft., with a tower 128 ft. high, the first four stages of which are Romanesque work of about 1140. The prebendary stalls of richly carved oak remain. Of the bishops of Dunblane, far the most celebrated was Robert Leighton, who held the see 1661–72, when he was translated to Glasgow. A path near the river, which he is said to have frequented, still bears the name of 'The Bishop's Walk;' and the library which he bequeathed to his diocese, is still kept in the town. Two m. from D. was fought, 1715, the indecisive battle of Sheriffmuir, between the royal forces, under the Duke of Argyll, and the troops of the Pretender, under the Earl of Mar. D. once had an ancient Culdee monastery. Pop. (1891) 2,186.

**DUNCAN**, *dŭnk'an*, ADAM, Viscount: British admiral: 1731, July 1180—4, Aug. 4; b. Lundie, in Scotland. He entered the navy as midshipman 1746, became lieut. 1755, and in 1761 commander of the *Valiant*, which took part in the expedition to Havana under Admiral Keppel. In 1789 he was appointed Rear-Admiral of the Blue, and in 1793, Vice-Admiral of the Blue, but had little opportunity of distinguishing himself, and was even meditating, it is said, retiring altogether from the service, when he was appointed to the command of the united English and Russian squadron in the North Sea, with the special design of watching the movements of the Dutch fleet—Holland and France being then at war with England. D.'s blockade of the Texel was one of the most effective ever made, and the Dutch trade was almost ruined. During the blockade, a mutiny took place among the seamen, and D.'s position was for some time very critical, but the insubordination was ultimately quelled. Although weakened by the recall of the Russians, he gained a brilliant victory over the Dutch near Camperdown, 1797, Oct. 11, taking the Dutch admiral, De Winter, prisoner. D. was rewarded with a pension of £2,000, and raised to the peerage, with the title of viscount. In 1799, he was promoted to the rank of Admiral of the White.

**DUNCAN**, THOMAS, R.S.A. and A.R.A.: 1807, May 24—1845, May 25; b. Kinclaven, Perthshire, Scotland. He studied in the Trustees' Acad., under Sir William Allan; was his successor as head-master of that school, and one of



## DUNCANSBY HEAD—DUNCIAD.

the most distinguished members of the Royal Scottish Academy. His portraits, and historical and fancy subjects, show delicate feeling, and keen appreciation of the humorous, with correct drawing and clear coloring. Though he exhibited but few pictures in the Royal Acad. of London, they attracted marked attention, and he was elected an assoc. of that body 1843. The principal works that he exhibited there were: *Anne Page and Slender*; an illustration from the ballad of *Auld Robin Gray*, now in the Sheepshanks Gallery, South Kensington; *Prince Charles's Entry into Edinburgh after the Battle of Prestonpans*—and the same prince, when a fugitive, concealed in a cave. He had now entered on a most successful career, and was engaged on the studies for two important works: *Wishart Dispensing the Sacrament on the Day of his Martyrdom*; and a large picture for the Marquis of Breadalbane, *Queen Victoria at Taymouth*, when he was seized with an illness which terminated fatally at Edinburgh. One of his latest works was an excellent portrait of himself, now in the National Gallery of Scotland. D.'s portraits, especially those of ladies and children, will always hold a high place. Among the historical and fancy subjects from him exhibited in the Royal Scottish Acad. were—1829, *The Death of Old Morality*; 1831, finished sketch of *Jeane Deans and the Robbers*; 1835, *Mary Queen of Scots Compelled to Sign her Abdication*; 1836, *A Covenanter*, and *Old Mortality Renewing the Inscription on a Tomestone*; 1838, *The Secret Chamber—Isaac of York Visiting his Treasure*; 1846, the finished sketch of *Wishart Dispensing the Sacrament on the Day of his Martyrdom*, March 1, 1546.

**DUNCANSBY HEAD**, *dũnk'anz-bĩ hẽd* (the *Berubium* of Ptolemy): promontory forming the n.e. extremity of Caithness, lat. 58° 39' n., and long. 3° 1' w., one mile and a half e. of John o'Groats's House. In the vicinity are deep long chasms or *ghoes*, in the Devonian strata, and curious detached sandstone columns in the sea called *stacks*. One of the chasms is 300 yards long, 12 to 15 wide, and 100 feet deep, and communicates with the sea by three openings, one of which is arched. The horizontal beds of the sides of the perpendicular gullies look like ruined walls.

**DUNCE**, n. *dũns* [from *Duns Scotus* (q. v.), great leader of the schoolmen in the dark ages, opponents of the revival of learning; called after him *dunsmen* or *duncemen*]: one who is dull or weak in intellect; one slow at learning; a dolt. **DUNCISH**, a. *dũns'ish*, like a dunce. **DUNCE'DOM**, n. the realm or domain of dunces.

**DUNCH**, v. *dũnsh*, or **DUNT**, v. *dũnt* [Dan. *dundse*, to thump: L. *tundẽrẽ*, to beat, to strike: Let. *dunksch*, the sound of a blow with the fist]: in *Scot.* and *OE.*, to push or jog with the fist or elbow; to give a nudge: N. a. push or jog; a nudge. **DUNCH'ING**, imp. **DUNCHEd**, pp. *dũnsht*. **DUN'TING**, imp. **DUNTEd**, pp. *dũn'tẽd*.

**DUNCIAD**, *dũns'ĩ-ad*, **THE**, by Alexander Pope: published 1728, in three books; to which a fourth was added 1742. Pope had been, during the greater part of his career,



## DUNCOMBE—DUNDAS.

afflicted by a host of critics and detractors. His own genius had not been spared; the worst motives, personal and literary, had been imputed to him; and he resolved to mete unto his enemies the measure which had been meted unto himself. Hence the origin of *The Dunciad*. Never was chastisement more complete. On its publication, a general howl of rage and pain arose. The satire conferred immortality on his opponents. Pope was a good hater, and his hatred and contempt defy the tooth of Time more completely than all the preservative balsams of the Pharaohs.

**DUNCOMBE**, *dŭn kum*, THOMAS SLINGSBY: 1796–1861, Nov. 13: English politician. He was elected M.P. for Hertford in 1824, assisted in carrying the reform bill, and became prominent in the extreme liberal party. In 1834 he was returned for Finsbury, which seat he retained in the parliament which assembled 1859. In 1842, he presented the Chartist petition, signed by 3,000,000 of the lower classes in favor of universal suffrage, vote by ballot, short parliaments, etc. In 1842, the then home sec., Sir James Graham, having sanctioned the opening of the letters of Mazzini, D. in the house of commons denounced, with scathing invective, the adoption of the post-office spy-system on English soil. He was an earnest advocate of Jewish emancipation; and his motion, 1858, for placing Baron Lionel Rothschild on a committee of the house of commons, was soon followed by the concession, by the latter chamber, of the right of Jewish members to sit in the house of commons.

**DUNDALK**, *dŭn-darck'*: municipal borough and seaport, cap. of Louth county, Ireland; beautifully situated at the mouth of the Castleton river, 50 m. n. of Dublin. It is overlooked on the n.e. by the Carlingford Mountains. Vessels drawing 16 ft. can enter the harbor. D. has manufactures of tobacco, soap, leather, starch, and salt; steam flour-mills; considerable fisheries; a distillery, brewery, and a flax-spinning mill. The chief imports, especially from Liverpool, are groceries, timber, coal, iron, slates; and the exports, flax, linen, and all sorts of agricultural and dairy products and live stock. D. is the chief outlet for the produce of the counties of Louth, Monaghan, and Cavan. It has the remains of a Franciscan friary, and a Druid's circle. The last king of all Ireland was crowned here. Edward Bruce took D. 1315, and held his court here till killed in battle at Faughart, in the vicinity, 1318. D. was captured by the Irish 1641, by Cromwell 1649, and by Schomberg 1689. In 1879–80 the annual value of property was £20,133; the harbor revenue was £9,246. In 1878, 919 vessels, of 162,983 tons, entered the port. Pop. (1871) 11,327, of whom 8,969 were Rom. Cath.; (1881) 11,974; (1891) 12,449.

**DUNDALK BAY** is eight m. by seven, with four to six fathoms water in the middle. It receives the Fane, Dee, and Castleton rivers.

**DUNDAS'** island belonging to Great Britain, on the n.w. coast of America, 40 m. n.e. of Queen Charlotte Island.

## DUNDAS.

It has Dixon's Entrance (q.v.) on the w., and is separated by Chatham Sound from the most southerly of the Alaskan islands.

DUNDAS: group of nearly 500 islets, all of coralline formation, off the e. coast of Africa, about lat.  $1^{\circ}$  s. There is only one secure harbor.—An African river named Dundas, flows into Delagoa Bay (q.v.).

DUNDAS: strait in n. Australia, separating Melville Island from Coburg Peninsula, 18 m. in breadth.

DUNDAS: town in the province of Ontario, Dominion of Canada, at the head of Burlington Bay, at the w. of Lake Ontario. Pop. (1881) 3,709; (1891) 3,546.

DUNDAS, *dŭn-dŭs'*: castle and manor on the s. bank of the Firth of Forth, near s. Queensferry; the castle is a square tower of the 15th c., with modern additions; the manor was the original seat of the distinguished family of D., to whose progenitor it was granted by the Earl of March about 1150.

DUNDAS' (of ARNISTON): Scottish family singularly distinguished for legal and political talent.

Sir JAMES DUNDAS, the first of Arniston, received knighthood from James VI., and was gov. of Berwick. His son, Sir JAMES D., was appointed a judge of the court of session 1662, and took his seat on the bench under the title of Lord Arniston, but was soon deprived of office for refusing to abjure the 'National and Solemn League and Covenant.' He died 1679; and his eldest son, Sir ROBERT D., who also rose to the bench, died 1727.

ROBERT D., 1685–1753; son of Sir Robert, in 1717 was appointed solicitor-gen. for Scotland; in 1720 lord advocate; and in 1722 was chosen to represent the county of Edinburgh in the British parliament. In 1725, D. resigned his seat, and 1737, he was raised to the bench, when, like his father and grandfather, he took the title of Lord Arniston. He was appointed lord pres. 1748. As an advocate, he was a powerful and ingenious reasoner, and though somewhat disliked on the bench, his ability was universally admitted.

ROBERT D., 1713, July 18—1787, Dec. 13; eldest son of Robert; studied at Edinburgh and Utrecht, was admitted to the Scottish bar 1738, and rose to be lord advocate (1754) and pres. of the court of session (1756).

DUNDAS', the Right Honorable HENRY, Viscount MELVILLE, and Baron DUNIRA: 1741–1811, May 27; younger son of Robert (1685–1753). He was educated at the Univ. of Edinburgh, and admitted to the Scottish bar 1763. He was successively appointed depute-advocate and solicitor-general; in 1774, was returned to parliament for the county of Edinburgh, and 1775 was appointed lord advocate for Scotland. Two years later he was made keeper of the king's signet for Scotland. In parliament D. unexpectedly allied himself with the party in power, and became a strenuous supporter of Lord North's administration, and one of the most obstinate defenders of the

## DUNDEE.

war with the American colonists; but when the coalition ministry was formed by Fox and Lord North, he passed over to the side of his old opponent, and became Pitt's ablest coadjutor. When Pitt returned to the helm of the state 1784, D. was appointed pres. of the board of control. In 1791, he was appointed principal sec. of state for the home department. He also held a great number of other offices. D.'s aptitude for business was undeniable, and many important public measures originated with, or were directly promoted by, him. When Pitt resigned 1801, D. did the same. In 1802, under the administration of Mr. Addington, he was elevated to the peerage. In 1806, he was acquitted of charges of 'gross malversation and breach of duty,' while acting as treasurer of the navy. After this, however, he took little part in public affairs. He died at Edinburgh.

DUNDEE, *dŭn-dē'* (Lat. *Taodunum*, the 'hill or fort on the Tay'): royal, parliamentary, and municipal burgh and seaport, in the s. of Forfarshire, Scotland, on the left bank of the estuary of the Tay, here two m. broad, 10 m. from the entrance of that river into the sea, 50 m. n.n.e. of Edinburgh, 20 e.n.e. of Perth, 14 s.e. of Forfar. In population, it is the third town in Scotland. It stands mostly on the slope between Dundee Law (571 ft. high, composed of trap, and with traces of ancient vitrification) and Balgay Hill and the Tay. The new streets are wide and well laid out. The most striking architectural features of the town are—the Town Hall, in the Roman Ionic style, with a spire 140 ft. high, erected by the 'Elder Adam,' 1734; the Albert Institute and Free Library, in 15th c. Gothic, from designs by Sir Gilbert Scott, erected (1865-74) at a cost of £30,000; the Royal Exchange, in the Flemish pointed style of the 15th c., at a cost of upward of £12,000; the Eastern Club House; the Corn Exchange, capable of containing 2,000 people; the Infirmary; the Justiciary and Sheriff Court Buildings; the Post-office; the High School; the Town's Churches, with the old tower, 156 ft. high; St. Paul's Episc. Church; St. Paul's and St. Enoch's Free Churches; the Morgan Hospital for the maintenance and education of 100 boys; and the new Orphan Hospital. D. Univ. College, instituted by Miss Baxter for both sexes, was opened 1883. It began with a clear endowment of £100,000, and a staff of five professors; and had over 350 students in its first session. Its scheme includes evening classes for those unable to enter on a systematic course of training during the day. D. has several public parks. D. is the chief seat in Great Britain of the manufacture of coarse linen fabrics (Osnaburgs, sheetings, ducks, dowlas, drills, canvas, and eordage). Manufactures of jute are carried on almost exclusively here. The consumption in D. of this material, which is grown in India, amounts to fully 300,000 tons annually. The raw material costs in D. less than 4c. per lb.; and the cloth made from it, reckoned by weight, is the cheapest textile fabric made in Great Britain. Of jute many varieties of fabric are made, from the coarsest nail-bagging to carpets of great beauty.



## DUNDEE—DUNDONALD.

This range includes pack-sheets for every species of merchandise, sacks for wool, coffee, guano, etc. The annual value of the flax, hemp, and jute manufactures in D. is upward of £5,500,000. D. is famous for its manufacture of confectionery, which is exported to all parts of the world. One firm uses 150 tons of bitter oranges annually in the manufacture of marmalade. D. is the centre of the whale and seal fishing trade of Great Britain. Ship-building (both wood and iron) and machine-making are carried on to some extent. D. has magnificent harbors, in addition to the tide harbor, several large wet docks, a graving-dock, and a slip for large vessels. The docks have been erected at a cost of upward of £700,000. In 1883, 1,158 vessels, of 473,623 tons, entered the port. The direct railway communication of D. with the south, established 1878 by the Tay bridge, two m. long, was interrupted by a sad disaster at the end of 1879, when a great part of the bridge and a passenger train passing over it were thrown into the river. Steps were soon taken to have the bridge rebuilt at a somewhat lower elevation. D. sends two members to parliament. It was an important place in the 12th c. Edward I. was here twice. Wallace is said to have taken the castle 1297, and Bruce demolished it 1313. The Duke of Lancaster burned D. 1385, and the Marquis of Montrose pilaged it 1645. Charles II. lived here, after his coronation at Scone, 1650. On the refusal of D. to submit to Cromwell, General Monk, 1651, sacked and burned it, massacring 1,000 citizens and soldiers, and filling 60 vessels with booty, which were wrecked on their voyage to Eng. D. was one of the first Scotch towns to adopt Reformation. Wishart the martyr preached here during the plague of 1544. Pop. (1871) 118,977; (1881) 140,239; (1901) 160,871.

**DUNDEE, VISCOUNT:** see GRAHAM, JOHN.

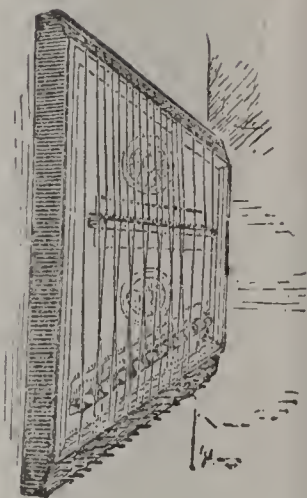
**DUNDER**, n. *dŭn'dĕr* [Sp. *redundar*, to overflow]: the lees or dregs of cane-juice, used in the distillation of rum.

**DUNDERHEAD**, n. *dŭn'dĕr-hĕd* [Sw. *dunser*, a heavy-footed man]: a stupid fellow; a dunce. **DUNDER-HEADED**, thick-headed; stupid.

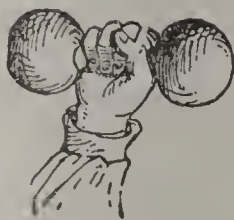
**DUNDONALD**, *dŭn-dŏn'ald*, THOMAS COCHRANE, Earl of: 1775, Dec. 14—1860, Oct. 31; son of the ninth Earl of Dundonald. He, while still a boy, entered the 104th regiment. At the age of 17, he joined the *Hind* corvette, commanded by his uncle, Capt. Sir Alexander Cochrane. In 1800, he became master and commander of the *Speedy* sloop-of-war, 14 guns and 54 men; and in ten months he took 33 vessels, carrying together 128 guns and 533 men, besides assisting in the capture of many others. D. received his post-rank, 1801, for the capture, by boarding, of *El Gamo*, a Spanish frigate of 32 guns, off Barcelona. In 1803, he was appointed to the *Arab*, 22, and served at the blockade of Boulogne. In 1804, he removed to the *Pallas* frigate 32, and was sent out to assist his uncle in the blockade of Ferrol. He made several valuable prizes while cruising off the Spanish coast, among others the *Fortuna*, with specie to the amount of £150,000, besides merchandise, but gen-

erously returned 10,000 crowns to the Spanish captain and supercargo. In 1806, he cut out the *Tapageuse* corvette, which lay in the Gironde, under the protection of two heavy batteries. He destroyed the semaphores along the French coast, and carried by storm the battery at Pointe l'Equilon, which he blew up. Being now transferred to *L'Impérieuse*, he took and destroyed, in the month ending 1807, Jan. 7, 15 of the enemy's ships, chiefly laden with wine and provisions. He was next sent to co-operate with the patriots on the coast of Catalonia, and contributed to the surrender of the castle of Mongat. After harassing the French coast, and destroying the semaphores on the coast of Languedoc, he volunteered for the defense of Fort Trinidad, at Rosas, on the coast of Catalonia. At the head of 80 of his own men, and the same number of Spaniards, he repelled 1,000 of the enemy in an assault made by them upon the castle. He protracted the siege for 12 days, then blew up the magazine, and returned to his ship. In 1809, April, he was selected by the Admiralty for the daring and hazardous service of burning the French fleet then lying at anchor, and blockaded by Lord Gambier, in the Basque Roads. At night he went on board one of the fireships, containing 1,500 barrels of gunpowder, and performed the service intrusted to him with characteristic intrepidity. He was rewarded with the knighthood of the Bath. He had been chosen M.P. for Westminster 1807; and his charges of incompetency against Lord Gambier led to a court-martial upon that nobleman. Lord Gambier, after a partial trial, was acquitted, and the professional prospects of his assailant were ruined. During the rest of the war, the country lost the incalculable benefit of his services at sea. Early in 1814, he was accused of complicity in fraudulent stock-jobbing transactions. A rumor of the downfall of Napoleon having caused a sudden rise in the funds, D. and his friends were charged with having fraudulently propagated the rumor, and with having 'sold out' to a large amount. He was found guilty of fraud, and was sentenced to pay a fine of £1,000, to suffer a year's imprisonment, and to stand in the pillory. The latter part of the punishment was remitted, but he was deprived of the order of the Bath, of his rank in the navy, and expelled from the house of commons. A new writ was issued for Westminster; but his constituents immediately re-elected him, notwithstanding his expulsion from the house; and his daring was shown by his escape from prison, and his re-appearance in the house. He represented Westminster until 1818, when, panting for a more active and eventful career, he drew his sword in defense of the independence of the S. American colonies of Spain. The command of the fleet of the republic of Chili was offered to him, and the terror of his name materially contributed to the success of the national cause. Valdivia, last stronghold of the Spaniards, was captured by him. Another daring exploit was the cutting out of a large 40-gun frigate from under the guns of the castle of Callao, 1820, Nov. 5. The emperor of Brazil Dom Pedro, afterward gave him the command of the Brazilian fleet,

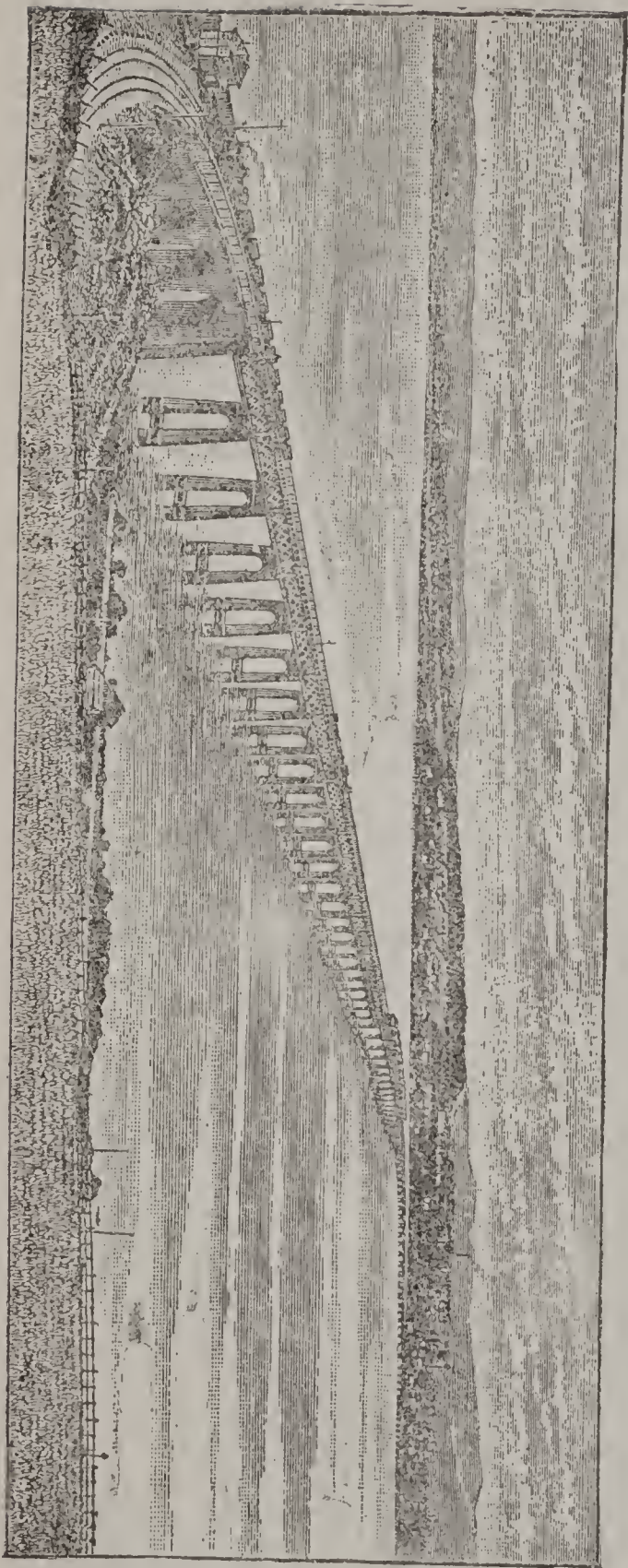




Dulcimer.



Dumb-bells.



Tay Bridge. looking toward Dundee.



## DUN-DRIVER—DUNE.

and created him a marquis. In 1827 and 1828, he assisted in the Greek war of independence. In 1830, the Whig administration of Earl Grey came into office, and, believing him to have been the victim of a cruel and unjust persecution, hastened to restore him to his naval rank. In 1831 he succeeded to the earldom. In 1847, Queen Victoria conferred on him the grand cross of the Bath. He was also appointed commander-in-chief on the N. American and W. India station. In 1851 he was vice-admiral of the white, and in 1854, rear-admiral of the United Kingdom, a distinction which he held until his death. On his retirement from active service, he applied himself to scientific inventions. He turned his attention especially to naval projectiles. He declared himself to be in possession of a means of annihilating an enemy's fleet, and during the Russian war offered to destroy Sebastopol in a few hours with perfect security to the assailants. His plans were, however, rejected. When upward of 80 years of age, he published his Autobiography—the record of a career almost unequalled even by British seamen for desperate service and dauntless exploit. His burial was in Westminster Abbey. In his naval expeditions, it was his fate to be constantly opposed to forces greatly superior to his own in numbers and metal. His inventiveness and fertility of resource under such circumstances have perhaps never been equalled. His daring would have been, in a man of less genius, the height of rashness, yet the almost unvarying success of his maneuvers and exploits attests his forethought, and his happy adaptation of slender means to great enterprises. In person, he was tall and broad built, and of commanding stature, though with a slight stoop, contracted by service in the small sloops and corvettes of his early days. His features were Scottish in character, and strongly marked, bearing in deep lines the traces of struggle, sorrow, and the wear and tear of an unusually long, active, and eventful life.—In 1877 a petition was presented to the queen, asking compensation to D.'s heirs for his 18 years' loss of pay and allowances as a naval officer—which was ultimately granted,

**DUN-DRIVER**, n. (*Mergus merganser*, or *castor*): the goosander (q.v.). See also **MERGANSER**.

**DUNDRUM BAY**, *dŭn'drŭm*: inlet of the Irish Sea, on the e. coast of Ireland, county Down, 5 m. s. of Downpatrick. It is about 10 m. wide at its entrance, and forms a long curve into the shore, with a uniform breadth of about  $2\frac{1}{2}$  miles.

**DUNE**, n. *dŭn* [Celtic, *dun*, a hill, a fortified place: F. *dune*, a sandhill]: a low hill of moving sand on the coast; a rude circular building with conical roof; a mound; a kind of rude fortification—also spelled **DUN**. **DUNES** [see **DUN**, verbal root]: the sand-hills or mounds which stretch less or more along the sea-coast of the Netherlands and n. of France. These D. are a natural curiosity. 'As if anxious to save the low countries from tidal inundation, Nature has for centuries been energetically working to increase

## DUNEDIN.

the magnitude of the mounds on the coast. At low water, when the beach is exposed to the action of the winds from the German Ocean, clouds of sand are raised into the air, and showered down upon the country for at least a mile inland; and this constantly going on, the result is, that along the whole line, from Haarlem to about Dunkirk or Calais, the coast consists of sandy mounds of great breadth, partially covered with grass and heath, but unfit for pasturage or any other purpose, and these are the bulwarks which protect the coast. In some places these D. look like a series of irregular hills, so high that they shut out the view of the sea even from the tops of the steeples. The traveller, in visiting them from the fertile plains, all at once ascends into a region of desert barrenness. He walks on and on for miles in a wilderness such as might be expected in Africa, and at last emerges on the sea-shore, where the mode of creation of this singular kind of territory is at once evident. Loose particles of sand are blown in his face; and as he descends to the shore, he sinks to the ankle in the drifted heaps. In some parts of these dreary solitudes, the sandy soil has been prevented from rising with the wind and injuring the fertile country, by being sown with the seeds of a kind of bent-grass, and in a few spots fir-trees have been successfully planted.'—*Tour in Holland*, by W. Chambers. The English term *down* (q.v.) has a similar meaning: see also DRIFT-SAND.

DUNEDIN, *dŭn-ĕd'in*: capital of the provincial dist. of Otago, in New Zealand; lat. 45° 50' s., long. 170° 36' e., on the e. side of South Island, toward its s. extremity. It is 200 m. by sea from Lyttleton, and 150 m. from Invercargill. Since its foundation by the New Zealand Company, 1848, the city has rapidly increased in importance; chiefly after 1861, when the discovery of extensive gold-fields in the neighborhood caused sudden increase of population. For three years, the city, as well as the province, made great strides in wealth and prosperity; and though subsequently the excessive increase of population was checked by a decrease in the yield of gold, D. has made steady progress. Within the last few years, the population has been increased by immigration from the colony of Victoria. D. is divided into four wards. It is as well laid out as the hilly nature of its site will allow; it is well paved, and lighted with gas. There are many handsome buildings—about a dozen of them churches; the new bank of New Zealand, completed 1882, is one of the finest in the city. D. is the seat of an Anglican and a Rom. Cath. bishop. Other public buildings are the post-office, hospital, government buildings, mechanics' institute, etc.; and the inhabitants of the city possess places of recreation in the Vauxhall Gardens, Botanical Gardens, and the grounds of the Acclimatization Society. The univ. and high school are flourishing institutions. There are several daily papers, and numerous weeklies and monthlies. Among the manufactories, a woollen one is the principal. The street tramways are worked by locomotives. Railways connect D. with Christchurch to the north and Invercargill to the



## DUNFERMLINE.

south. D., which is the most important commercial city in New Zealand, has frequent communication with the other colonial ports, with Melbourne and Britain. Pop. (1881), city proper 24,372, an increase of above 9,500 since 1871; (1901) 24,879, or with suburbs 52,390.

DUNFERMLINE, *dŭn-fĕrm'lin* or *dŭm-fĕr'lin*: royal burgh in Fife, Scotland, of the w. dist. of which it is the chief town. The town is on a long swelling ridge, 3 m. from the Firth of Forth, 16 m. w.n.w. from Edinburgh. It stands 300 ft. above the mean level of the firth, and from the s. has an imposing appearance. The date of its origin is not known, but it was a place of note before the end of the 11th c. Here King Malcolm Canmore and his queen, St. Margaret, between 1070 and '93, founded an abbey for Benedictines brought from Canterbury. In 1303-4, Edward I. of England wintered here, the buildings being then described as capable of accommodating three kings and their suites. In 1588, D. was created a royal burgh by James VI. David II., James I. of Scotland, and Charles I. were born here; and Malcolm Canmore, his queen Margaret, Edgar, Alexander I., David I., Malcolm the Maiden, Alexander III., Robert Bruce, his queen Elizabeth, and nephew Randolph, Annabella, queen of Robert III., Robert Duke of Albany, gov. of Scotland, were buried in the abbey and its precincts. The tomb of Robert the Bruce was discovered at the building of the new church, which was opened 1821. The skeleton of the king was disinterred, and a cast was taken of the cranium. Some interesting fragments of the ancient regal and ecclesiastical magnificence of D. remain. What is called Malcolm Canmore's Tower is a mass of shapeless ruins, but the s. wall of the palace of the Stuarts is still seen overhanging the romantic glen of Pitencrief, a noble wreck, with massive flying buttresses. Of the abbey, the Frater Hall or refectory, and a tower and arched gateway, remain. The nave of the abbey church, consecrated 1150, is in the Romanesque style, 106 ft. long and 55 ft. wide. The choir, built about 1250, a fine example of the First Pointed style, was taken down 1818-21, when it was replaced by what is now the parish church, surmounted by a square tower 100 ft. high, round which is the inscription, in open hewn capital letters, 'King Robert the Bruce.' The modern history of D. is notable in connection with the rise of Scottish dissent, Ralph Erskine and Thomas Gillespie having respectively been founders of the Seceder and Relief bodies, now joined under the name of United Presbyterians. The staple trade of the town is damask linen-weaving, which took its rise about the beginning of last century. See DAMASK. There are establishments for the spinning of linen yarn, and several large factories where steam and hand loom weaving is carried on. There are likewise large collieries and lime-works, iron foundries, breweries, dye-works, and fire-clay works. The public buildings are—town-house and county buildings, each having a spire, and the prison, poor-house, and music-hall. There are eight fairs, a monthly cattle-



## DUN-FLY—DUNG BEETLE.

market, and one weekly market for grain or country produce. Pop. of burgh (1881) 17,085; (1901) 25,250.

DUN-FLY, *n.*: species of artificial fly used in angling.

DUNG, *n.* *dǔng* [Dan. *dygge*, to sprinkle with water: prov. Dan. *dung*, wet through: Sw. *dynga*, muck: Ger. *dung*, manure; *dǔngen*, to manure]: the refuse or filth from animals; excrement; anything filthy or rotten: V. to manure with dung. DUNG'ING, *imp.* DUNGED, *pp.* *dǔngd*. DUNGY, *a.* *dǔng'i*, filthy; full of dung. DUNGHILL, a heap of dung; a dirty, vile abode: ADJ. sprung from the dunghill; base; mean. DUNG-MEER, *n.* a pit where dung, weeds, etc., are mixed to lie and rot together.

DUNGANNON, *dǔn-gǎn'on*: parliamentary and municipal borough in the e. of Tyrone, Ireland, near a tributary of the Blackwater, 11 m. n.n.w. of Armagh, 8 m. w. of Lough Neagh. It lies on a hill-slope, in a densely peopled district, with high mountains to the west. It is well built, and consists of a square with diverging streets. In the vicinity are the largest lime-quarries and collieries in Ulster. The chief manufactures are linen, earthenware, and fire-brick. It sent a member to parliament till 1885. It was the chief seat of the O'Neils, the kings of Ulster, till 1607. Its castle was destroyed by the parliamentary forces 1641. Pop. (1861) 3,886; (1881) 4,081; (1891) 3,812.

DUNGARVAN, *dǔn-gár van*: parliamentary and municipal borough, seaport, and bathing-place, Waterford county, Ireland, 25 m. w.s.w. of Waterford. The people are engaged chiefly in hake, cod, herring, and other fisheries. The chief exports are grain, butter, cattle, and fish. Vessels of more than 250 tons cannot discharge at the quay. D. has the remains of an Augustinian abbey, founded in the 7th c. by St. Garvan, and the remains of walls built by King John, who also built the castle, now used as barracks. Pop. of D. (1871) 7,719; (1881) 7,377; (1891) 5,263.

DUNGARVAN BAY is 3 m. wide, about the same in length, and one to five fathoms deep.

DUNG BEETLE: common name of many coleopterous insects of the fam. *Scarabæidæ*, which feed upon the dung of animals, and for the most part live in it. They are found in all parts of the world. Many of them belong to the section of *Scarabæides* called *Coprophagi* (Gr. dung-eaters); but others, as the DOR, or SHARD-BORN BEETLE (*Geotrupes stercorarius*), to the section called *Arenicoli* (Lat. sand-dwelling), distinguished by peculiarities in the antennæ, mandibles, etc. Neither section, however, consists exclusively of insects entitled from their habits to be called dung-beetles, some of the *Coprophagi* feeding chiefly on marine vegetables in a state of putrescence, and some of the *Arenicoli* on the roots of plants.



Dung-Beetle (*Geotrupes stercorarius*).

## DUNGEON—DUNGLISON.

The **DOR** is one of the most common British beetles; it is of a stout form, less than an inch long; black, with brilliant metallic and blue reflections on the under surface; it may often be heard droning through the air toward the close of the summer twilight, and finds its way with rapidity and certainty to cow-dung, on which it feeds, and under which it burrows, making a large cylindrical hole, often of considerable depth, and depositing therein its eggs, enveloped in a mass of dung. These habits—more or less modified—are shared by many other species, which thus not only hasten the removal of what would otherwise become offensive on the surface of the ground, but even distribute it in the soil, where it affords nourishment to plants. The sacred beetle or *Scarabæus* (q.v) of the Egyptians (*Scarabæus sacer*, or *Ateuchus sacer* of modern entomologists) is a true D. B., one of the *Coprophagi*, in size and color much resembling the dor. It is found not only in Egypt, but in the s. of Europe and w. of Asia, and deposits its eggs in dung, which it rolls into little balls for the purpose. A nearly allied insect (*Gymnopterus pilularius*), a native of N. America, is known as the **TUMBLE-DUNG BEETLE**, from its habit of rolling globular pellets of dung to the place where they are to be buried in the earth. Several individuals sometimes combine their strength in this curious operation, which is performed by the hind-feet pushing backward.—The dor, and some other dung beetles, simulate death to deceive their enemies when they apprehend danger not, like many insects, by contracting their bodies as much as possible, and drawing in their legs, but by stretching every part out to the utmost, and rigidly fixing themselves in that position. Crows and other birds are supposed to prefer them in a living state.

**DUNGEON**, n. *dŭn'jŭn* [F. *donjon*, the large tower of a fortress—from mid. L. *dominiŏnem*, *domgŏnem*, or *dongĕ-ŏnem*, a tower, a work of defense—from *dŏmŭs*, a house: comp. Gael. *dundion*, the hill or fort of security—from *dun*, hill; *dŏn*, shelter]: originally the large and strongest tower of a fortress, to which the garrison could retreat in case of necessity, the lower apartments of such being used as prisons; a close dark prison, commonly underground; any deep dark place. **DUN'GEONED**, pp. a. *jŭnd*, confined in a dungeon. See **DONJON**.

**DUNGIYAH**, n. *dŏn-gĕ'ya* [Arab.]: in *naut.*, a species of vessel employed in the coasting trade on the shores of Arabia, etc. It has one long mast.

**DUNGLISON**, *dŭng'glŭ-son*, **ROBLEY**, M.D., LL.D.: 1798, Jan. 4—1869, Apr. 1; b. Keswick, England: med. prof. and author. He studied medicine in London and Erlangen, Germany, received his degree at the latter city 1823, was appointed prof. of medicine in the Univ. of Va. 1824, served there till 1833, was prof. of materia medica and therapeutics in the Univ. of Md. 1833–36, and of the institutes of medicine in the Jefferson Med. College, Philadelphia, 1836–68. He translated and edited a number of foreign medical works, and published about 20 original vols.,



## DUNKARDS—DUNKIRK.

among which the best known are—*Principles of Human Physiology* (1832), *New Dictionary of Medical Science and Literature* (1833), revised and republished as *A Dictionary of Medical Science* (1865), *Elements of Hygiene* (1835), *General Therapeutics* (1836), *Medical Student* (1837), *New Remedies* (1839), and *Practice of Medicine* (1842).

DUNKARDS, or DUNKERS: see TUNKERS.

DUNKELD, *dŭn-kĕld'* or *dŭn-kĕl'*: city and burgh of barony in the east of Perthshire, Scotland, 15 m. n.n.w. of Perth. It lies in a deep romantic hollow, on the great e. pass (of Birnam) to the Highlands, on the left bank of the Tay, across which it communicates with the south by a handsome bridge, built 1809 by the Duke of Athole. It is environed by dark-wooded and craggy mountains. D. is a place of great antiquity, dating probably from the 7th or 8th c. About 1130, King David I made it the seat of a bishopric, of which the Culdees of the ancient abbey were the chapter. The choir of the cathedral, chiefly in the First Pointed style, was built between 1318 and '37; the nave, in the Second Pointed style, between 1406 and '64; and the tower and chapter-house, also in the Second Pointed style, between 1470 and '77. The choir is now the parish church. The nave, in ruins, contains one or two ancient monuments. The monument of the Wolf of Badenoch (Alexander Stuart, Earl of Buchan, died 1384) lies in the vestibule. The Duke of Athole's grounds, unsurpassed in Scotland for extent and beauty, lie w. and n. of D., and include the cathedral; Craig-vinean and Craig-y-Barns; 50 m. of walks, and 30 m. of drives; falls of the Bran (upper one, 80 ft.), near Ossian's Hall at the Rumbling Bridge, and 20 sq. m. of larch-wood, including the first two larches planted in Britain (1737). D., in ancient times, is said to have been the seat of the Pictish kings. It was the seat of a diocese until 1688. Three m. south of D. stood Birnam Wood, famous in connection with the fate of Macbeth.—Pop. of D. (1881) 768; (1891) 613.

DUNKIRK, *dŭn'kĕrk*: city, port of entry, Chautauqua co., N. Y.; 40 m. s.s.w. of Buffalo, 48 m. n.n.e. of Erie, 460 m. w.n.w. of New York; terminus of the Erie, Lake Shore and Michigan Southern, and the D. Alleghany Valley and Pittsburgh railroads. It is on Lake Erie, has a commodious harbor rendered particularly safe for the locality by a break-water, large and substantial wharves, several lines of steamboats and sailing vessels connecting it with other lake ports, and a valuable shipping trade. Its industries comprise the extensive locomotive works and machine shops of the Erie railroad, a foundry and several iron works, coal, and grain elevators, several flour and saw mills, oil refineries, breweries, and manufactories of glue, sashes, doors, and blinds, and agricultural implements. There are 2 national banks, cap. \$205,000; 11 churches, divided denominationally as follows: Rom. Cath. 3, and Bap., Meth. Episc., Congl., Presb., Prot. Episc., German Evang., Lutheran, German Meth. Episc., each 1; an opera-house, orphan asylum, monastery, public hall, several graded



## DUNKIRK—DUNLIN.

Schools, library, and 2 daily and 2 weekly newspapers. Is supplied with water by the Holly system, is lighted by gas and elec. has ample street R. R. service. Pop. (1870) 5,231; (1880) 7,248; (1890) 9,416; (1900) 11,616.

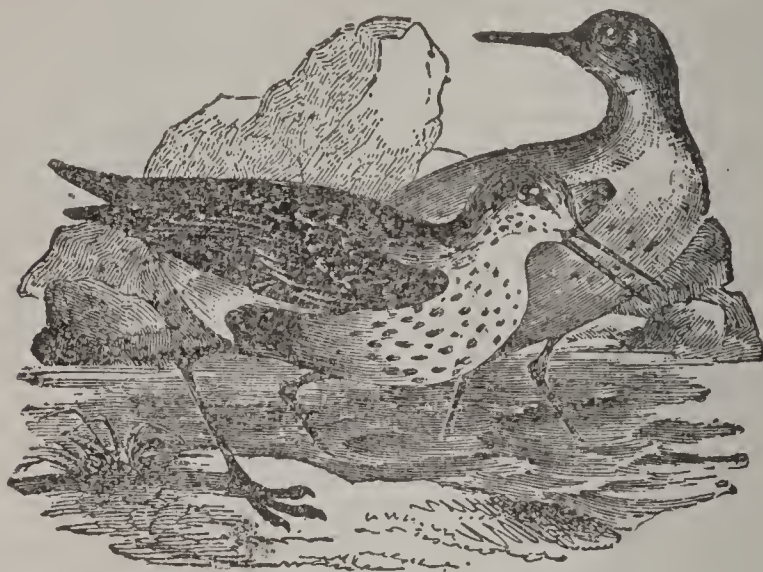
**DUNKIRK**, *dŭn'kĕrk*, or **DUNKERQUE**, *dŭng-kärk'*: most northerly seaport and fortified town of France; on the e. shore of the Strait of Dover, in the dept. of Nord, distance from Paris in a direct line about 155 m. n., and from Lille about 43 m. n.w. The town, which is connected by railway and canal with the principal manufacturing centres of Belgium and France, is surrounded by ramparts and ditches, and is defended by a citadel. It is well built, the streets spacious and well paved, the houses chiefly of brick. Its quay and pier, its church of St. Eloi—a Gothic structure, having a handsome though incongruous frontispiece in its Corinthian portico—its town-hall, barracks, college, and theatre, are the principal architectural features. The harbor of D. is shallow, and the entrance difficult, but the roadstead is large and safe. D. has manufactures of soap, starch, beer, beetroot-sugar, cordage, and leather; also metal foundries, distilleries, salt-refineries, and ship-building yards. Forming as it does the outlet for the great manufacturing dept. of Nord, its trade by sea is considerable. Since becoming a free port, it has carried on a good trade in wine and liqueurs. Its cod and herring fisheries are actively prosecuted. The immediate vicinity of D. has a dreary and uninteresting appearance.

D. is a place of historic interest. It owes its origin, it is said, to the church built by St. Eloi in the 7th c., in the midst of a waste of sand-hills or dunes, and hence its name, 'Church of the Dunes.' D. was burned by the English 1388, taken by them under Oliver Cromwell in 1658, but sold to Louis XIV. by Charles II. 1662. By the treaty of Utrecht, 1715, the French were compelled to destroy the fortifications of D., which were restored, however, 1783. In 1793, the allies under the Duke of York laid siege to D., but were compelled by the French to retire, after suffering severely. D. was made a free port 1826. Pop. (1881) 36,644; (1891) 39,498; (1901) 40,329.

**DUNLIN**, n. *dŭn'lin* [AS. *dune*, a sand-heap; Gael. *linne*, a pool or lake]: called also **PURRE** (*Tringa alpina*, *T. cinclus*, or *T. variabilis*): bird of the family *Scolopacidae* (snipes, etc.), and of the large group to which the names sandpiper and stint are variously given. It is not quite nine inches in length from the extremity of the bill to that of the tail. The plumage undergoes great variations in summer and winter. It is very widely diffused. In summer, it frequents even the desolate shores of Melville Island. It is seen in autumn and winter on the shores of Britain and of most parts of Europe; often in vast flocks on sandy or muddy sea-shores; and is equally common on those of America, northerly, where it is the larger var. *Pacifica*, and is known as Ox-bird, and Red-backed Sandpiper, being chestnut-brown above, black-streaked,

## DUNLOP—DUNNAGE.

‘When flying in great autumnal flocks, its aerial movements are extremely beautiful, each individual of the vast assemblage yielding so instantaneously to the same impulsion as to exhibit alternately the upper and the under surface of the body, so that we have for a time a living, mov-



Dunlin (*Tringa variabilis*):  
Summer and winter plumage.

ing cloud of dusky brown, and then a brilliant flash of snowy whiteness.’

**DUNLOP**, n. *dŭn'lop*: the name of a parish in Ayrshire and Renfrewshire, in Scotland; a kind of rich, white cheese made in Scotland of unskimmed milk.

**DUNMORE**, *dŭn-mŏr'*: town, Lackawanna co., Penn., 3 m. e. of Scranton, 12 m. n.e. of Pittston, on Delaware Lack. and West., and the Penn. Coal Co.'s R. Rs. It is in the great anthracite coal region of the Lackawanna valley, is an important shipping point of the coal industry, and has several churches and graded public schools. Pop. (1870) 4,311; (1880) 5,311; (1900) 12,583.

**DUN'MOW FLITCH OF BACON**: prize instituted at Dunmow, in Essex, England, 1244, by Robert de Fitzwalter, on the following conditions. ‘That whatever married couple will go to the priory, and kneeling on two sharp-pointed stones, will swear that they have not quarrelled nor repented of their marriage within a year and a day after its celebration, shall receive a flitch of bacon.’ The prize was first claimed 1445 two hundred years after it had been instituted. After 1751, up to which date only five presentations had taken place, the flitch was not again claimed till 1855. The tenth occasion of awarding the flitch occurred in 1876. •

**DUNNAGE**, n. *dŭn'nāj* [probably Gael. *dun*, a mound, a hill; or Manx, *doon*, to close, to darken]: loose miscellaneous substances such as boughs, wood, old mats or sails laid on the bottom of a ship as a bed for heavy goods.



## DUNNED—DUNNOTTAR CASTLE.

DUNNED, DUNNING, DUNNISH: see under **DUN** 1 and 2.

DUNNET HEAD, *dŭn'nĕt hĕd*: rocky peninsula, 100 to 600 ft. high, most northerly point of Scotland, on the n. coast of Caithness; lat.  $58^{\circ} 40'$  n., and long.  $3^{\circ} 21'$  w. It consists of upper old red sandstone, resting on the middle flagstone of the same system. It is frequented by various species of sea-fowl, among which is the puffin.

DUNNING, n. *dŭn'nĭng* [from *dun*, of a dark-brown color]: in *Amer.*, a particular method of curing codfish.

DUN'NOCK: See **HEDGE-SPARROW**.

DUNNOTTAR CASTLE, *dŭn-nŏt'tĕr*: ancient seat, now in ruins, of the Keiths, Earls Marischal of Scotland, on the Kincardineshire coast, a mile and a half s. of Stonehaven. It occupies the top of a rock 3 acres in extent, and 160 ft.



Dunnottar Castle.

high, overhanging the sea, with a deep though dry chasm between it and the mainland, and it is approached by a steep winding path. In 1296, Wallace is said to have taken the rock and the kirk of Dunnottar from the English. During the Commonwealth, the Regalia of Scotland were hid in the castle from the republican army, and before the garrison surrendered to Cromwell's troops, 1651, the Regalia were removed and secreted in the church of Kinneff, by Mrs. Grainger, the minister's wife. In the times of James II. and Charles II., D. C. was one of the state prisons, where the Covenanters were confined. It was dismantled after the rebellion of 1715, on the attainder of the last Earl Marischal.



## DUNOIS-DUNOON.

DUNOIS, *dū nwá*, JEAN (called the Bastard of Orleans), Count of Dunois and Longueville: brilliant French soldier, 1403-1468, Nov. 24; natural son of Louis Duke of Orleans, brother of Charles VI., and brought up in the house of that prince with his legitimate children. D. is said to have been intended for the priesthood, but this is doubted. His first important military achievement was the overthrow of the English at Montargis (1427). He next threw himself into Orleans with a small body of men, and bravely defended the place till the arrival of the famous Joan of Arc, whose religious enthusiasm combined with the valor of the Bastard raised the drooping spirits of the French, and the English were obliged to raise the siege. This was the turning-point in the fortunes of the French nation. In 1429, D. and the Maid of Orleans won the battle of Patay, after which he marched, with a small body of men, through the provinces then overrun by the English, and took the fortified towns. The capture and death of Joan of Arc arrested for a moment the progress of the French arms, but the heroism of D. was irresistible. He took Chartres, the key of Paris, forced Bedford to raise the siege of Lagny, chased the enemy from Paris, and within a very short period deprived them of all their French conquests except Normandy and Guienne. The next grand series of successes on the part of D. was the expulsion of the English from Normandy. Town after town yielded—Rouen, Harfleur, Honfleur, Caen, Falaise, Cherbourg. This splendid campaign lasted only a year and six days. Not less triumphant was his career immediately after in Guienne; Montguyon, Blaye, Fronsac, Bordeaux, and lastly Bayonne, fell into his hands. The English, in fact, were swept out of the country, and the freedom of France from all foreign occupation permanently secured. Louis XI., on his accession to the throne, 1462, dispatched D. as gov. to Genoa, which had yielded itself to France, but soon, in a fit of jealousy and suspicion, deprived him of all his offices. D. now placed himself at the head of the alliance *Pour le Bien Public*, and by the treaty of Conflans, 1465, recovered all his confiscated estates. There is scarcely any other name more popular in France than that of D.; there is no hero so national; he labored 25 years for the deliverance of his country, and this *alone*—his sword was never unsheathed, except against the English. He never had a force under him which could enable him to win a victory that might balance Agincourt or Crécy, but the multitude and constancy of his petty successes served the cause of France more effectively than great and sanguinary contests would have done.

DUNOON, *dūn-ôn'*: one of the most frequented sea-bathing places and summer residences in the w. of Scotland; in the s.e. of Argyllshire, on the w. side of the Firth of Clyde, nine m. w. of Greenock. A village stood here from a very early date, but a new well-built town, with fine villas around, has of late years sprung up. D. Castle, of which only a small part remains, stood on a conical hill near the pier, and was once a royal palace and strong for-

## DUNS—DUNS SCOTUS.

treſs. The Argyll family had a reſidence here, but the building became a ruin about 1700. Pop. (1891) 5,283.

DUNS, *dũns*, or DUNSE: burgh of barony in the Merſe, in the middle of Berwickſhire, Scotland, the largeſt town in the county; on an eminence on the Whitadder. To the n. of the town is Duns Law, 630 ft. high. The name Dunſe was changed to Duns (the ancient form) 1882. Pop. (1881) 2,437; (1891) 2,198.

DUNSINNANE, *dũn-sĩn'ũn*: one of the Sidlaw Hills, in the eaſt of Perthſhire, Scotland, 1,114 ft. high, 7 m. n.e. of Perth, and with a proſpect toward Birnam Hill (q.v.). On the top are the remains of the rampart and ſoſſe of an ancient fortification, popularly called Macbeth's Caſtle.

DUNS SCOTUS, *dũnz skõ'tũs*: one of the moſt famous ſcholastics of the 13th c. His hiſtory is partially obſcure. England, Scotland, and Ireland all claim the honor of his birth-place, but without any ſupport beyond inference from his name. As to the date of his birth, all that can be ſaid is, that it was in the laſt half of the 13th c. Whatever was the hiſtory of his youth, he entered early the order of Franciſcans, ſtudied at Oxford, and ſoon became prof. of theology. His prelections were attended by crowds of auditors, the number of ſtudents at Oxford then exceeding 30,000. About 1304, he removed to Paris, then the chief ſeat of ſcholastic philoſophy, where he taught theology with great applauſe. He was diſtinguiſhed for the zeal and ability with which he defended the immaculate conception of the Virgin againſt Thomas Aquinas. He is ſaid to have demolished 200 objections to the doctrine, and eſtabliſhed it by a cloud of proofs. It continued long a point of diſpute between the Scotiſts and Thomiſts; and it was only in 1854 that the dogma was by papal authority declared a neceſſary doctrine of the Rom. Cath. faith, which it is now heresy to deny. In 1308, D. S. was called to Cologne to oppoſe the hereſies of the Beguin brethren, and there he ſuddenly died, in the 34th or the 43d year of his life. D. S. was moſtly oppoſed to Thomas Aquinas, in theological opinions, and held very tenaciously the doctrine of the abſolute freedom of the human will, from whoſe ſpontaneous exerciſe he derives all morality. He was a reaſtiſt in philoſophy, and his followers are on that ground oppoſed to the Occamiſts, who were nominaliſts: ſee NOMINALISM. He defended his opinions in the ſtyle of dialectic then in vogue, and with an acuteness that got him the name of Doctor Subtilis. When, however, at the revival of learning, the followers of Duns, or *Dunsmen*, ſaw that the hair-splitting ſtyle of reaſoning was going out of faſhion, they 'raged,' as old Tyndal ſays, 'in every pulpit' againſt the new classic ſtudies, ſo that the name gradually came to ſignify not only one oppoſed to learning, but one ſlow at learning; hence our word *dunce*, a blockhead. It would be difficult to indicate the nature of his ſpeculative opinions without entering into particulars, nor are his writings as yet ſufficiently explored for the formation of a decided judgment. The moſt famous of his works, beſides his commentaries on the Bible and on

## DUNSTABLE.

Aristotle, is his Commentary on the Sentences of Peter Lombard, called the *Opus Oxoniense*, of which the *Opus Parisiense* is an abridgment. The chief edition of his works is that of Luke Wadding (12 vols. Lyon 1639), but it is far from complete. The controversies long carried on between the Scotists and Thomists owed their bitterness not so much to zeal for science and religion, as to the jealousy between the Franciscans and Dominicans.

DUNSTABLE, *dŭn'sta-bl*: town in the south of Bedfordshire, England, at the e. base of the Chiltern chalk-hills or Dunstable Downs, 18 m. s.s.w. of Bedford. It consists chiefly of one main street crossed by another. The houses are mostly of brick, some of them very old. D. is the chief seat of the British straw plait manufacture, which employs many women. Whiting also is made. In winter, many large larks are caught in the neighborhood, and sold chiefly in London as an article of luxury. Henry I. founded here a priory of Black Canons, of which the present parish church is a part. D. was the scene of some of the earliest theatricals, 1110, the subject being the miracles of St. Catherine, by Abbot Geoffry of St. Albans. Pop. (1881) 4,627; (1891) 4,513.



## DUNSTAN.

DUNSTAN, *dŭn'stan*, SAINT : 925-988, May 19; b. at or near Glastonbury, in Somersetshire, England. He was of noble birth, and is said to have been remotely related to the royal family, and more nearly related to high dignitaries in the church. His early studies were superintended by Irish teachers; but besides his professional learning, D. possessed a variety of accomplishments. He was an excellent composer in music; he played skilfully on various instruments; he was a painter, a worker in design, and a calligrapher; a jeweller, and a blacksmith. While quite a youth he was presented at the court of King Athelstan, who seems to have been delighted with his music; but the courtiers envying the favor of the sovereign, denounced him as a dealer in sorcery, and procured his expulsion from court. D. now began to figure in a new character. Contiguous to the church of Glastonbury, he erected a cell, five ft. in length by two in breadth, the floor of which was sunk beneath the surface, while the roof, on the outside, was only breast-high, so that he could stand upright in it, though unable to lie at full length. This was at once his bed-chamber, his oratory, and his workshop. It was here that (according to the monkish legends) he had his most celebrated contest with the devil. One evening, while the saint was employed at his forge, the devil thrust his head in at the window, and began to tempt him with some immoral propositions. D. patiently endured the annoyance until his tongs were red hot in the fire, when, snatching them suddenly up, he seized the foul fiend by the nose, and held him till the whole neighborhood resounded with the clamor of his agony. Gradually, D. acquired a great reputation for sanctity; and on the accession of Edmund to the throne 940, he was recalled to court; but in spite of the exploits and penances which had made his banishment illustrious, he was still opposed by the courtiers, who saw his ambition, and dreaded his talents. A second time D. was dismissed, but the king made him Abbot of Glastonbury, and increased the privileges of that monastery. \* Edred, nicknamed *debilis pedibus* (weak in the feet), who succeeded Edmund 946, showed D. great favor. The saint now began to distinguish himself as a statesman, and the vigorous policy of Edred's reign is affirmed to have proceeded from the inspiration of Dunstan. If that was the case, then to D. was owing the complete subjugation of the Northumbrian Danes. Edred was succeeded by Edwy 955, who detested D., and not without reason, for the saint, on the day of Edwy's coronation, had grossly insulted his wife and her mother. Besides, Edwy had long suspected D. of peculation in his charge, and this outrage made his wrath overflow. D. was deprived of his clerical office, his places at court were taken from him, his so-called reform—viz., of compelling the clergy to become celibates—was frustrated, the monks were driven out of their monasteries, their functions handed over to the secular clergy, and D. himself was banished. He fled to Flanders, narrowly escaping having his eyes put out by the messengers whom the infuriated king had sent after him. After D.'s flight,

a rising took place among the Northumbrian Danes, instigated by Odo, Abp. of Canterbury, himself a Dane, and a friend of the expatriated saint. Edgar, the brother of Edwy, was chosen king of the whole of the island n. of the Thames, and D. returned in triumph from his brief exile. Meanwhile, Edwy's beautiful wife, Elgiva, had been seized and murdered, under circumstances of horrid cruelty, by the Mercians, who were armed in the cause of D. and Odo, or, as others say, by the immediate retainers of these ecclesiastics themselves. Edwy himself died of a broken heart, or (according to an old ms. in the Cottonian Library) was assassinated 958, and was succeeded by his brother Edgar. The latter, as a boy of 15, could exercise little authority: he was long a passive instrument in the hands of D. and his party, who used their power in establishing their cause over the whole island, in enforcing the celibacy of the clergy, and in driving out by main force from all abbeys, cathedrals, and churches, all such married clergymen as would not separate from their wives. At the same time, it cannot be denied that D. and the monks ruled the kingdom with vigor and success, and consolidated the detached states into compacter union than had ever been known before. The Danish districts of Anglia and Northumbria were divided into earldoms or governments; the fleet of the king was increased to 360 sail, which acted as a most efficient coast-guard, preventing the Norse rovers from making their usual destructive descents on the country. In 960, D. was made abp of Canterbury on the death of his friend Odo, when, according to custom, he went to Rome to receive the pall at the hands of the pope. He also induced Edgar to visit in person every part of his dominions annually, when courts of justice were held in the various districts, audiences and feasts given, and appeals heard. The many other beneficial measures of Edgar's reign, such as the reform of the coinage, and the endeavor to extirpate wild animals in the mountainous districts, are generally, and with good reason, attributed to Dunstan. The king, who was zealous for the celibacy of the clergy, was himself one of the most viciously profligate of the Saxon kings; yet D. could wink at his crimes, so long as he himself was allowed to carry out his 'religious' schemes. On the death of Edgar, a fierce struggle took place between the partisans of Edward the Martyr and his half-brother Ethelred. The cause of the former was espoused by D., who succeeded in placing his favorite on the throne; but the mother of Ethelred, named Elfrida, a beautiful but ferocious woman, caused Edward to be murdered 979, and D. was compelled to place the crown on the head of Ethelred. The credit and influence of the great monk now declined; his threatenings of divine vengeance were treated with contempt; and soured and exasperated at the triumph of his enemies, he retired to his archiepiscopal city, where he died of grief and vexation. D. was a man of extraordinary abilities. His vigor, his persistency of purpose, and his stern and unscrupulous disposition, would have elevated him to power in any age; but he possessed,



## DUNSTER—DUODECIMAL.

in addition to these qualities, a deep knowledge of the weaknesses of human nature, and a clear and penetrating understanding, which enabled him to see what it was necessary and prudent for a ruler to do. Hence, though despotic to the last degree, he was not blindly so, like a common-place despot. His ambition was ever under the control of his wisdom and his fixed ideas. But the grand designs of his life—viz., the complete subjection and conformity of the Anglo-Saxon church to that of Rome, and the extension and multiplication of ecclesiastical interests—are not such as excite general admiration in modern times, and Englishmen in later days have greatly regretted the success of the unpatriotic labors of the saint. That he *was* successful, there can be no doubt. Though personally out of favor at court in the latter years of his life, his efforts to spread his official influence were unceasing. Early in his career, he had introduced a new order of monks into the land, the Benedictines, whose strict discipline had changed the character and condition of ecclesiastical affairs, and in spite of the confusion and even opposition thus caused, he persevered to the end. Monasteries continued to be founded or endowed in every part of the kingdom; and such were the multitudes who devoted themselves to the cloister, that the foreboding of the wise Bede was at length accomplished—above a third of the property of the land was in possession of the church, and exempted from taxes and military service. D.'s *Concord of Monastic Rules* will be found in Reyner's *Apostolatus Benedictinorum in Anglia*, fol., Duac. 1626, page 77 of the Appendix. Other writings have been attributed to him. See Wright, *Biog. Brit. Lit., Ang.-Sax. Period*. See also William of Malmesbury, Lingard's *History of England*, Kemble's *Saxons in England*, book II., and *Memorials of St. Dunstan*, edited by W. Stubbs, M.A. (1875), a collection of six biographies of the saint.

DUNSTER, *dŭn'stér*, HENRY: 1612–1659, Feb. 27; b. Lancashire, England. He was educated at Magdalen College, Cambridge; became a non-conformist, and emigrated to the United States to escape persecution 1640; was elected the first pres. of Harvard Univ. shortly after his arrival and installed into that office and the pastorate of the First Church (Congl.), Cambridge, 1640, Aug.; and occupied both offices till 1654, Oct., when he was compelled to resign for preaching against the validity of infant baptism. He was tried and placed under bonds for this offense, and soon afterward was indicted by the grand jury for neglecting the baptism of one of his own children. He subsequently removed to Scituate, Mass., and preached there till his death. Pres. D. was a man of profound learning, an eminent oriental scholar, and an authority on the Hebrew language.

DUNT: see DUNCH.

DUODECIMAL, a. *dŭ'ô-dēs'î-màl* [L. *dŭōdēcīm*, twelve—from *dŭō*, two; *dēcēm*, ten]: computing by twelves. DU'ODEC'IMALS, n. plu., a rule in arithmetic; a kind of multiplication in which the denominations proceed by twelves,



## DUODECIMFID—DUPANLOUP.

a method of calculating the area of a rectangular surface when the length and breadth are stated in feet and inches. **DU'ODEC'IMO**, n. -*mō* [It. *duodecimo*, twelfth]: that form of volume whose leaf is equal to the twelfth part of a folio—the folio being the large sheet called the *broadside*, folded once. A book is said to be *quarto*, *octavo*, *duodecimo*, etc., because the sheet of which the pages of the book are made up has been folded into four, eight, twelve, leaves, etc. *Quarto*, *octavo*, and *duodecimo*, are almost always written 4to, 8vo, and 12mo. See **PAPER**. **DU'ODEC'IMALLY**, ad. -*lī*. **DUODECIMAL SCALE**, name given to the division of unity into 12 equal parts, as when the foot is divided into 12 inches and the inch into 12 lines; or the pound is divided into 12 ounces. This plan of counting has some advantages, as 12 admits of so many divisions into equal parts—viz., by 2, 3, 4, and 6. But the decimal scale, or division into ten equal parts, is now universally recognized as practically preferable, from its coinciding with the decimal system of notation almost universally in use.

**DUODECIMFID**, a. *dū-ō-dēs'īm-fīd* [L. *duodecim*, twelve; *findo*, I cut]: divided into twelve parts.

**DUODECIMOLE**, n. *dū-ō-dēs'h īm'o-lā* [It.]: in *mus.*, a group of twelve notes.

**DUODENARY**, a *dū-o-dēn'a-rī* [L. *duodecim*, twelve]: pertaining to the number twelve; proceeding by twelves; twelvefold. **DUODENARY ARITHMETIC**, n, in *math.*, a system of computation in which the local value of the digits increases twelvefold as they proceed from right to left, instead of tenfold, as in ordinary computation. **DUODENARY-SCALE**, n. the same as duodecimal scale.

**DUODENUM**, n. *dū'ō-dē'nūm* [L. *dūōdēnī*, twelve each]: the first part of the small intestines immediately succeeding the stomach, which in man is about twelve inches in length. **DU'ODENAL**, a. -*nāl*, connected with, or relating to, the duodenum: see **DIGESTION**.

**DUODRAMA**, n. *dō-ō-drām'a* [Italian]: dramatic piece for two performers only.

**DUOLO**, n. *dwo'lo* [It.]: grief; in *mus.*, with grief, sadness, pathos.

**DUP**, v. *dŭp* [contraction of *do up*, as *doff* = do off, and *don* = do on: Swiss, *tuffen*, to open]: to do up; to fasten; in *OE.*, to open. **DUP'PING**, imp. **DUPPED**, pp. *dŭpt*.

**DUPANLOUP**, *dŭ-pāng-lō'*, FÉLIX ANTOINE PHILIBERT, Bishop of Orleans: 1802, Jan. 3—1878, Oct. 11; b. St.-Félix, Savoy. He was educated in Paris; ordained a Rom. Cath. priest 1825; appointed confessor to the Comte de Chambord 1827, catechist to the Orleans princes 1828, and almoner to Mme. la Dauphine 1830; was naturalized 1838; and after the revolution was appointed superior of the diocesan seminary at Paris. In 1849 he was appointed bp. of Orleans, 1854 elected a member of the French Acad., and 1871 elected a member of the corps législatif, and nominated abp. of Paris, but declined that office. He published a number of works including *Education*, 3 vols. (1855-57),

## DUPE—DUPIN.

*The Higher Intellectual Education* (1866), *Christian Marriage* (1868), *Elements of Sacred Rhetoric*, *Exposition of the Principal Truths of the Catholic Faith*, *Manual of the Catechism*, beside funeral orations and pastoral letters.

DUPE, n. *dūp* [F. *dupe*, one who lets himself be deceived—from *duppe*, the bird called the *hoopoe*]: one who is deceived; one easily led astray; a credulous person: V. to cheat; to trick; to deceive by imposing on one's credulity. DUPABLE, or DUPEABLE, a. that may or can be easily duped, gulled, cheated, or deceived. DUPEABILITY, n. capability of being easily duped or gulled; easy credulity. DU'PING, imp. DUPED, pp. *dūpt*. DU'PER, n. one who. DU'PERY, n. *-pēr-ŷ*, the act or practice of duping.

DUPIN, *dū-pāng'*, ANDRÉ MARIE JEAN JACQUES: French statesman and lawyer: 1783, Feb. 1—1865; b. Varzy, dept. of Nièvre. He studied in Paris. In 1815, he was elected a member of the chamber of representatives, when he opposed the motion for proclaiming Napoleon II. successor to the throne. During the same year, he published his treatise, *Sur la Libre Défense des Accusés*. The attention excited by this work procured him the honor of defending Marshal Ney, and afterward the English officers, Wilson, Bruce, and Hutchinson, accused of having favored Lavalette's escape. He defended also the poet Béranger in 1821. From 1825—29, he was the advocate of the liberal party. In his pamphlet, *La Révolution de 1830*, he endeavored to prove the legal character of this revolution; and on the question being mooted whether the new king should assume the title of Philippe VII., D. declared 'that the Duke of Orleans was called to the throne not *because* he was a Bourbon, but *although* he was a Bourbon, and on the condition that he should not follow in the footsteps of his predecessors.' After having been appointed to various important offices by the new government, D. found it necessary to pass over to the opposition, and was eight times chosen pres. of the chamber of deputies. At the revolution of 1848, he urged (but unsuccessfully) the chamber to proclaim the Comte de Paris king of the French, with the Duchess of Orleans regent during his minority. In consequence of the confiscation of the Orleans estates 1852, D. resigned his place, and retired for a time from public life; but in 1857 he consented to resume his previous office of *Procureur-Général* of the court of cassation. He was author of many important works, mostly on legal question, among which were *Manuel du Droit Ecclésiastique Français*, which was censured by the congregation of the *Index* at Rome. In 1853 appeared his *Le Morvan: Topographie, Agriculture, Mœurs des Habitants, Etat Ancien, Etat Actuel*; and in 1857, *Règles Générales de Droit et de Morale tirées de l'Ecriture Sainte*.

DUPIN, FRANÇOIS PIERRE CHARLES, Baron: French economist: 1784. Oct. 6—1873; b. Varzy, dept. of Nièvre; brother of André Marie Jean Jacques D. He was educated at the Polytechnic School, Paris. During the Empire, he was actively employed as engineer. Between 1816—19, he made several visits to England and Ireland, to study the

great works of construction in those countries. The results of his investigations appeared in his *Voyages dans la Grande Bretagne* (6 vols. Paris 1820-24, with atlas)—a comprehensive statement of the advantages and defects of British internal administration, exhibiting in a popular form a complete view of the roads, canals, aqueducts, bridges, ports, etc., of the country. D. was about this time appointed member of the Académie des Sciences, and in 1824 was raised to the rank of baron. In 1828, he was elected deputy for the dept. of Tarn, and he took part with the liberal opposition. After the February revolution of 1848, D. was member of the constituent assembly. After the *coup d'état*, he became a senator of the Empire. D. published many works on geometry, commerce, etc.

DUPLEIX, *dü-plü'*, JOSEPH FRANÇOIS: celebrated governor of the French Indies: born about the close of the 17th c.; d. 1763. In 1720 he was appointed to a seat in the council at Pondicherry, and ten years later became superintendent at Chandernagore. The remarkable success of his administration here led to his being appointed, in 1742, gov.-gen. of all the French Indies. His policy had already begun to alarm the English Company, when war broke out in Europe between France and England (1744). La Bourdonnais, gov. of Mauritius, having sailed with a powerful squadron to the Coromandel coast, took Madras, but stipulated to surrender it on payment of a certain sum. This, however, D. refused to accede to, and violent disputes followed between the two governors, the result of which was that La Bourdonnais was recalled. The ambitious mind of D. now formed the project of founding a French empire in India on the ruins of the mogul monarchy, and with this purpose he meddled with all the intrigues of southern and central India, made himself master of the court of Hyderabad, and placed a creature of his own on the throne of the Carnatic, while he impressed the native imagination by adopting all the pomp and splendor of the Oriental. His military designs, however, were frustrated by the English, but the struggle continued until 1754, in which year D. was recalled. The French Company had not seconded his ambitious schemes, and refused to reimburse him for the vast sums he had spent out of his private fortune in promoting the war. He died in poverty and neglect.

DUPLEX, a. *dü'plëks* [L. *duplex*, twofold, double—from *duō*, two; *plēō*, I fold]: twofold; denoting a peculiar kind of watch in which the scape-wheel has two sets of teeth producing a double action; denoting the system of telegraphy which enables messages to be sent from both ends of the same wire at the same time: see under TELEGRAPH. DUPLEX-ESCAPEMENT, n., in *horology*, an escapement so called from the double character of its scape-wheel, which has spur and crown teeth. It was invented by Dr. Hooke about 1658, and improved by Dyrer and Breguet. DUPLEX-LATHE, n. a lathe invented by Fairbairn for turning off, screwing, and surfacing. DUPLEX-PUMPING ENGINE, n. an arrangement in which two steam-engines of equal dimen-



## DUPLICATE—DUPONT.

sions are placed side by side, one operating the steam valves of the other. **DUPLEX-PUNCH**, *n.* a punch having a counter-die mounted on an opposite jaw, as the ticket-punch; a punch having a force derived from the rolling action of two levers on a common fulcrum, forming a toggle. **DUPLEX-RATIO**, *n.*, in *math.*, the product of a ratio. **DUPLEX-TYPE**, *n.*, in *photog.*, a name given to a mode of taking two photographs of the same person in different positions by two operations, so that he shall appear in two characters, for instance, playing the piano and accompanying himself on the violin. It is done by two exposures, with some skilful mode of hiding the division line. Shive's duplicating reflector is constructed for this purpose.

**DUPLICATE**, *a.* *dū'plī-kūt* [*L. duplicātus*, doubled—from *dūō*, two; *plīcō*, I fold: *It. and F. duplicata*, a duplicate]: double; twofold: *N.* a second thing corresponding to the first; a copy; a pawnbroker's ticket; in *law*, a document corresponding exactly in all essential points with another, and differing from a copy only in having all the validity of the original, as the *duplicate* of a lease, etc.: *V.* to double; to fold. **DUPPLICATING**, *imp.* **DUPPLICATED**, *pp.* **DUPPLICA'TION**, *n.* *-kā'shūn* [*F.—L.*]: the act of doubling. **DUPPLICATION OF THE CUBE**: see **DOUBLING THE CUBE**.—**DUPPLICA'TURE**, *n.* *-tūr* [*F.—L.*]: a doubling; a fold. **DUPPLICITY**, *n.* *dū-plīs'ī-tī* [*F. duplicité*—from *L. duplicītātem*]: doubleness of heart or speech; deceit; deception; in *law*, the pleading of two or more distinct matters or single pleas. **DUPPLICATE RATIO**: see **PROPORTION**.—**SYN.** of 'duplicity': dissimulation; guile; double-dealing; doubleness.

**DUPLO-**, *ad.* *dū'plō* [*L. duplus*, double, twofold]: in *chem.*, a prefix used to express twofold or twice as much; as, *duplo-carburet*, twofold carburet.

**DUPONCEAU**, *du-pōn'sō*, *F. dū-pōng-sō'*, **PETER STEPHEN**, *LL.D.*: 1760, June 3—1844, Apr. 1; b. in the island of Rhé, France: author. He came to the United States 1777, and served some time in the army as aide-de-camp to Baron Steuben; was naturalized 1781; studied law, and settled in Philadelphia to practice. He published a number of philological treatises, legal essays, and miscellaneous papers, and a *Dissertation on the Nature and Extent of the Jurisdiction of the Courts of the United States* (1824), and a *Memoir on the Indian Languages of North America* (1835), for which he received a prize from the French Institute. He was pres. of the American Philosophical Soc. many years.

**DUPONT**, *dū-pōng'*, **JACQUES CHARLES**, styled **DE L'EURE**: 1767, Feb. 27—1855; b. Neubourg, Normandy: leader of the French liberal party. During the revolution and the Empire, he filled several important offices. In 1813, he became a member of the legislative body, and acted as vice-pres. when this assembly was convoked by Louis XVIII. on the fall of Napoleon. During the Hundred Days he was elected to represent the dept. of Eure, and, after the battle of Waterloo, became vice-pres. of the chamber of representatives. After the revolution of 1830,

## DU PONT—DU PONT DE NEMOURS.

he was appointed minister of justice, but at the end of six months sent in his resignation, and took his place in the ranks of the opposition. After the revolution of 1848, during the session of Feb. 24, D. took the president's chair, and so far silenced the tumult of the populace, as to render it possible to appoint a provisional government, of which he was proclaimed president. His political friends styled him the most virtuous among the virtuous, the Aristides of French liberalism. His disinterestedness was not denied even by his enemies; but he manifested fidelity to his convictions rather than energy of character.

DU PONT, *du-pōnt'*, SAMUEL FRANCIS: rear admiral U. S. N.: 1803, Sep. 27—1865, June 23; b. Bergen Point, N. J.; grandson of PIERRE SAMUEL D. DE NEMOURS. He entered the navy as midshipman 1815, was commissioned lieut. 1826, and promoted commander 1842, capt. 1855, rear-admiral 1862. He was assigned to the command of the *Cyane* of the Pacific squadron 1846, July 23, and with it captured San Diego and La Paz, cap. of Lower Cal., and cleared the Gulf of Cal. of Mexican ships; led the line of boats that entered the harbor of Mazatlan prior to its capture 1847, Nov. 11. In 1859 he was appointed commandant of the navy yard at Philadelphia; 1860, Dec., took prompt measures to protect the landing of vols. at Annapolis; 1861, June, was made pres. of a board to prepare a plan for naval operations; Sep., was appointed flag officer; Oct., led the expedition that sailed from Norfolk; Nov. 7, captured the fortifications in Port Royal harbor; and subsequently occupied a long stretch of territory between Port Royal and St. Augustine, and established 14 blockading stations. For these services he received the thanks of congress and the newly-created rank of rear-admiral. He was relieved from active service 1863, July.

DU PONT DE NEMOURS, *dū-pōng' dēh nēh-môr'*, PIERRE SAMUEL: 1739, Dec. 14—1817, Aug. 6; b. Paris: political economist. At an early age, he became a believer in and an earnest advocate of Quesnay's principles of political economy, published several financial treatises 1762 and his first important book, *The Exportation and Importation of Grain*, 1764. This was followed by *The Origin and Progress of the New Science* and *Physiocratie* (1768), *Du Commerce de la Compagnie des Indes* (1769), *Histoire abrégée des Finances de l'Angleterre* (1769), and *Observations sur les Effets de la Liberté du Commerce des Grains et sur aux des Prohibitions* (1770). He was editor of the *Journal of Agriculture, Commerce, and Finance*, 1765-6, and subsequently of the economist organ *Ephémérides du Citoyen*; became a councillor of state under Calonne; sec. of the assembly of notables 1787; member of the national assembly 1790 and twice its pres.; was among the personal defenders of the king at the Tuileries 1792; was condemned to death but escaped through the death of Robespierre 1794; and was elected a member of the council of elders 1795, and its pres. 1797. In 1798 he came to the United States to escape persecution, prepared a scheme for a system of national edu-



## DÜPPEL—DUPUIS.

cation, and returned to France 1802. Napoleon tendered him various public offices, but he would accept none; he, however, became pres. of the chamber of commerce of Paris and of a number of benevolent institutions. He was sec. of the provisional govt. that sought the return of Louis XVIII., 1814, but on the reappearance of Napoleon, 1815, he again came to the United States where he died.

**DÜPPEL**, or **DYBBÖL**: village in the Prussian province of Schleswig-Holstein, 15 m. n.e. of Flensburg. During the war between Germany and Denmark it was bombarded for more than a month by the Prussians, and finally taken 1864, April. It and Sonderburg, on the island of Alsén, now constitute a strong fortress.

**DUPPER**, n. *dŭp'pēr*, or **DÛBBER**, n. *dŭb'bēr* [Hind. *dabba*]: a short-necked globular bottle made of buffalo-hide, for containing oils, etc., when sent from India.

**DUPRÉ**, *dŭ-prā'*, **GIOVANNI**: 1817, Mar. 1—1882, Jan. 8; b. Siena, Italy: sculptor. His father was an engraver on wood in humble circumstances, and apprenticed him to a carpenter when a mere boy. His natural artistic abilities were developed under adverse conditions, and when he had attained proficiency with the chisel, he was led by devotion to the Rom. Cath. Church to make a specialty of religious subjects. He received a first class medal at the French Universal Exposition 1855, and a second at that of 1867, received the cross of the French legion of honor 1867, and the Italian order of the crown 1868, and was elected an associate member of the French Acad. of Fine Arts 1869.

**DUPRÉ**, **JULES**: 1811, Apr. 5—1889, Oct. 6; b. Nantes; painter. He was the son of a porcelain manufacturer, and while following that industry took lessons in drawing, designing, and painting. He began exhibiting 1831, took a second class medal 1833, another at the Universal Exposition 1867, received the decoration of the legion of honor 1849, and became a grand officer 1870, and was a member of the committee on the Salon exhibition 1881.

**DUPUIS**, *dŭ-pwē'*, **CHARLES FRANÇOIS**: French *savant*: 1742, Oct. 16—1809, Sep. 29; b. Trie-Chateau, near Chaumont; son of a poor schoolmaster. At the college of Harcourt he so soon acquired extensive knowledge that at the age of 24 he was made prof. of rhetoric in the college of Lisieux. At the same time he studied law, and was admitted an advocate. He was led to the thought of explaining mythology by means of astronomy. After several communications in the *Journal des Savants*, appeared his *Mémoire sur l'Origine des Constellations et sur l'Explication de la Fable par l'Astronomie* (Par. 1781). He was now appointed prof. of eloquence in the Collège de France, member of the Académie des Inscriptions, and shortly afterward a member of the commission of public instruction. Although he rather shunned the storms of the Revolution, his reputation necessitated his becoming a member of the convention, next of the



## DUPUY—DUQUESNE.

Council of 500, and after the 18th Brumaire, of the legislative body. He was also one of the 48 individuals who formed the nucleus of the Institut National. His great work, *Origine de tous les Cultes, ou Religion Universelle* (12 vols.), which he had long withheld from fear of offending the religious world, was published at Paris, 1794. In his last work, *Mémoire Explicatif du Zodiac Chronologique et Mythologique* (Par. 1806), he attempts to prove the unity of the astronomical and religious myths of all nations.

DUPUY, *dü-pwē'*, CHARLES: 1851, Nov. 15—————: statesman; b. Le Puy, France. He was graduated at the École Normale des Hautes Études; spent several years teaching in provincial lyceums and colleges; became a school inspector 1880; and was appointed head-master of Corsica college and elected to the chamber of deputies as an advanced republican 1885. In 1892, Dec.—1893, Mar., he was minister of public instruction in the cabinet of M. Ribot; in 1893, Apr., became premier, also taking the portfolio of the interior; in Nov. following resigned with his entire cabinet and was succeeded by M. Casimir-Perier; 1894, Jan. 11, was a second time elected president of the chamber of deputies; in May succeeded M. Casimir-Perier as premier, on the election of the latter as president of the republic; and 1895, Jan., was succeeded by M. Ribot. He has published several works of a philosophical character, and his educational reports have commanded much attention.

DUPUYTREN, *dü-pwē-trông'*, GUILLAUME, Baron: 1777, Oct. 6—1835, Feb. 8; b. Pierre-Buffière, in Limousin, France: surgeon. He was educated at the Collège de la Marche in Paris; and on the formation of a new school of medicine there, 1794, was appointed *prosecteur*. In 1801 he was appointed *chef des travaux anatomiques*, and applied himself to pathological anatomy. In 1803 he was appointed assist. surgeon, and 1815 first surgeon at the Hôtel-Dieu. In 1813 he became prof. of surgery to the medical faculty; in 1820 Louis XVIII. conferred on him the title of baron, and in 1823 appointed him royal surgeon. He was the inventor of many ingenious modes of surgical operation and of various surgical instruments. He likewise made several important discoveries in pathological anatomy; and though he wrote very little, he formed a large school of enlightened surgeons in his native country. Among his works are *Leçons Orales de Clinique Chirurgicale Faites à l'Hôtel-Dieu* (4 vols. Par. 1830–34), and *Traité Théorique et Pratique des Blessures par Armes de Guerre*, edited by Paillard and Marx (Par. 1834).

DUQUESNE, *dü-kân'*, ABRAHAM, Marquis: 1610–1688, Feb. 2; b. Dieppe: French naval officer. He was trained under his father, the captain of a ship, for the naval service. In the war between France and Spain, he distinguished himself at Corunna, Tarragona, Barcelona, and other places. During the minority of Louis XIV., when the navy of France was inactive, he entered the service of Sweden, then at war with Denmark. D. defeated the Danish fleet near Gothenburg 1643, was elevated to the

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rank of vice-admiral, and by a succession of victories over the united fleets of Denmark and Holland, forced Denmark to conclude peace. He then returned to France, where he found the Spaniards prepared to support Bordeaux, which had declared itself for the party of the *Fronde* in 1650. D. immediately collected a squadron at his own expense, and compelled Bordeaux to submit. He was employed next in punishing the pirates of Algiers and Morocco who infested the Mediterranean. On the revolt of Messina against the Spanish government, France sent him to support the insurgents in the Mediterranean. With a small force, D. gallantly opposed the united fleets of Spain and Holland, commanded by De Ruyter, and 1676, Apr., completely defeated his enemies off the coast of Sicily, in the vicinity of Mount Etna. De Ruyter died a few days after. France thus obtained possession of the island of Sicily. Louis XIV. rewarded D. with the title of marquis and a considerable estate. On the revocation of the Edict of Nantes, D. was made the only exception to the general decree of banishment issued against all Protestants. His last achievement was the humiliation of Genoa. He died at Paris. See *Duquesne et la Marine de son Temps* (Par. 1872).

DUQUESNE, FORT: see BRADDOCK, EDWARD: FRENCH WAR.

DURABLE, a. *dūr'ă-bl* [F. *durable*—from L. *durab'ilis*, lasting, durable—from *dūrus*, hard: It. *durabile*]: having the quality of lasting long; not wearing out or decaying soon; permanent. DU'RABLY, ad. *-blī*. DU'RABLENESS, n. *-bl-nēs*, the state of being durable; power of lasting. DU'RABIL'ITY, n. *-bīl'ī-tī*, the power of lasting long without perishing.—SYN. of 'durable': lasting; enduring; persistent; firm; stable; constant; continuing.

DU'RA DEN: between Cupar and St. Andrews, in Fife-shire, Scotland, a small glen through which runs a tributary of the Eden; famous for the numerous and beautifully preserved fossil fish entombed in its yellow sandstone, one of the upper beds of the Old Red, 300–400 ft. thick. See *Dura Den*, by J. Anderson, D. D.

DURA-MATER, n. *dūr'ă-mā'tēr* [L. *dūrus*, hard; *māter*, a mother—in mid. L. *matter*, substance]: the tough fibrous outer membrane of the three membranes which invest the brain; the innermost membrane is called the *pia mater*, and the middle the *arachnoid membrane*. See NERVOUS SYSTEM.

DURAMEN, n. *dūr-ă'měn* [L. *durāmen*, hardness—from *dūrus*, hard]: the inner or *heart wood*, being the fully ripened wood of exogenous trees. The name is applied also to the harder and more highly colored portion of trees and branches. The division is often very marked between the *D.* and the *Alburnum* (q.v.) or sap-wood, the *D.* being more dense and compact, and its tubes thickened and filled with the peculiar secretions of the plant, so that juices no longer freely flow through them. It is also very frequently of a darker color than the *alburnum*: in ebony, it is black; and some other trees are remarkable for the peculiar color of their wood, which ap-



## DURAN—DURAND.

pears, however, only in the D., and not in the alburnum. As timber, it is much more valuable and durable than the alburnum; and the distinction is as well known to the carpenter or cabinet-maker as to the botanist

**DURAN**, *dü-röng'*, ÉMILE AUGUSTE CAROLUS: 1837, July 4—; painter; b. Lille, France. After studying in the Municipal School at Lille, he went to Paris 1853, and was a student at the Louvre, won a traveling scholarship and went to Rome for study 1861; afterward studied in Spain, and secured his first medal 1866, for *L'Assassiné*, a picture which the govt. purchased and placed in the museum at Lille. His reputation was greatly enhanced by a design for a ceiling in the Luxembourg 1878; but his fame rests largely on his skill as a portrait-painter. Among his noted works are the portraits of Émile de Girardin and of his daughters, an equestrian portrait of Mdle. Croizette, and a portrait of Pasteur, exhibited at the Royal Acad. 1888, which was greatly admired. He has received the decoration of the Legion of Honor and of the order of Leopold.

**DURANCE**, n. *dū'rāns* [L. *durans*, enduring, lasting: It. *duranza*, duration]: imprisonment; custody; restraint of the person; a term applied to the leathern dresses worn by the lower orders; a stout woolen stuff formerly made in imitation of buff leather, and used for garments; also called Durant and Tammy. **DURANT**, a. *dūr'ant*, lasting; continuing. **DURA'TION**, n. *-rā'shūn*, continuance; length in time; power of continuance; permanency. **DURANCE VILE**, confinement in prison.

**DURANCE**, *dü-röngs'*: river in the s.e. of France, rises in the dept. of the Hautes-Alpes, near the base of Mont Genève, one of the peaks of the Cottian Alps. It flows through the dept. of the Basses-Alpes in a southerly direction; then curving w., it proceeds toward the Rhone, forming the boundary between the depts. of Vaucluse and Bouches-du-Rhone, and joins that river about three m. below Avignon. Its principal affluents are the Buech and the Calavon from the right; and the Ubaye, the Bleone, the Asse, and the Verdon from the left. Its total length is about 180 m.—no part navigable. Its current is swift and impetuous, and carries down great quantities of sand and pebbles. Large quantities of timber are floated down from the forest districts upon its banks to Arles, and thence to the Mediterranean. An aqueduct 51 m. long has been recently constructed from the D. to Marseille. This great work not only supplies Marseille with water, but affords water-power for driving machinery, and irrigates an otherwise parched area of 25,000 acres.

**DURAND**, *du-rānd'*. ASHER BROWN: 1796, Aug. 21—1886, Sep. 17; b. Jefferson, N. J.: engraver and painter. He served an apprenticeship at engraving with Peter Maverick, in New York, 1812–17, became his partner, and established a high reputation as an engraver by cutting the steel plate of John Trumbull's painting, *The Declaration of Independence*, on which he was engaged three years. He made a specialty of portraits and, beside his own work for the pub-



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lications of the day, engraved many of the heads in *The National Portrait Gallery*. In 1835, he abandoned engraving, applied himself to painting, and became eminent in landscape work. He was a founder of the National Acad. of Design, 1826, and its pres. 1845-61. His principal landscapes are: *The Catskills from Hillsdale*, *The Franconia Mountains*, *Franconia Notch*, *Sunday Morning*, *The Rainbow*, *Primeval Forest*, *A Mountain Forest*, *Studies from Nature*, and *Kauterskill Clove*.

**DURANGO**, *dó-ráng'gō*: state in Mexico; between lat. 23° 37' and 27° 45' n., long. 102° 30' and 107° 17' w.; bounded on the n. by Chihuahua, e. by Cohahuila, s. by Jalisco, w. by Cinaloa; 42,645 sq. m. It is traversed by the Sierra Madre Mountains; has fine meadows and grazing lands, rich and fertile soil along its few streams: yields large crops of corn, maize, rice and other cereals; has large stock-raising interests. Its mountains abound in gold, silver and iron. Pop. (1892) 265,931; (1900) 371,274.

**DURANGO** city, cap. of La Plata co., Col., on Denver and Rio Grande r.r., 451 m. s.w. of Denver. Centre of an agricultural, stock-raising, and mineral region; 3 banks, 2 daily, 2 weekly newspapers. Pop. (1900) 3,317.

**DURANGO**, *dò-rang'gō*, or **GUADIANA**, *gwâ-dê-â'nâ*, sometimes called also **CIUDAD DE VICTORIA**, *thê-ô-thâth' dâ vîk-tô'rê-â*, in honor of the first pres. of the Mexican Confederation: city in Mexico, on the s. slope of the Sierra Madre, at the elevation of 6,848 ft.—almost a mile and a quarter—above the sea; lat. 24° 2' n., long. 104° 3' w. It is near the Culiacan (q.v.), being 150 m. to the n.w. of Zacatecas. It is the cap. of the state of D., and is regularly built, with a cathedral and other churches, and with convents, a theatre, and a mint; and the inhabitants carry on manufactures in iron, wood, wool, and leather. It was founded 1559 by Alonzo Pacheco, as a military post. It is the seat of a Rom. Cath. bishopric. Pop. (1900) 31,092.

**DURANT**, *du-rant'*, **HENRY TOWLE**: 1822, Feb. 20—1881, Oct. 3; b. Hanover, N. H.: lawyer and philanthropist. He graduated at Harvard Univ. 1841, was admitted to the bar 1846, changed his original name of Henry Welles Smith, began practicing in Boston, and became professionally associated with several of the most eminent lawyers of his day. He engaged in several business enterprises which yielded great wealth, and, in the midst of a lucrative practice, suddenly disposed of his legal interests and became a lay evangelist (Congl.) 1863. Soon afterward his attention was directed to the subject of the higher education of women, and he determined to provide an institution that should afford them superior advantages. His plans resulted in the erection, equipment, and endowment of Wellesley College, about 15 m. w. of Boston, which was opened 1875, Sep. The grounds, buildings, and equipment cost \$1,000,000, and he gave a further sum which produces \$50,000 annually for its support. He was a Christian worker of broad and unsectarian spirit, which is manifested in the rules of his college.

## DURANTE—DURBHANGAH.

**DURANTE**, *dô-rân'tā*, FRANCESCO: 1684, Mar. 15—1755, Aug. 13; b. Naples: musical composer. He received a charity-school education, studied music with Gaetano Greco and Scarlatti, applied himself to teaching and composition, and became director of the conservatory of Loreto 1742. His compositions, almost wholly for ecclesiastical use, number 62, and are distinguished by severity of style and purity of harmony. Many of his works have been presented in Europe and the United States with full orchestral accompaniment.

**DURAZZO**, *dô-rât'sô* (called by the Serbs *Dratsch*, and by the Slaves *Durtz*): maritime town of Albania, European Turkey, on the rocky peninsula of Peli, in the Adriatic; lat.  $41^{\circ} 19'$  n., long.  $19^{\circ} 27'$  e. It is fortified, and is a place of considerable antiquity. Its situation in a fertile district gives it an export trade in grain, oil, etc.; but in recent years, owing to partial failures in crops, and disease in olives, the exports have been small. D. has large imports of British manufactured goods; also of sugar, coffee, rice, soap, and iron. Pop. (1891) 1,200. D. is the ancient *Epidamnus*, founded abt. B.C. 627 by a conjoined band of Corcyraeans and Corinthians under one Phaleus, a Heracleidan. It became a great and populous city, but was much harassed by the internal strifes of party, which ultimately led to the Peloponnesian war (q.v.). Under the Romans it was called Dyrrachium (whence its modern name), and became the seat of a Roman colony, and an important landing-place for those sailing from Brundisium in Italy to Greece. Here Pompey was for some time beleaguered by Cæsar. Dyrrachium attained its highest consequence about the end of the fourth c., when it became cap. of the Byzantine eparchy of New Epirus. After being possessed successively by the Ostro-Goths, the Bulgarians, the Normans, and the Venetians, and having been destroyed by an earthquake, it was finally conquered by the Turks 1502, in whose possession it remains.

**DURBAN**, or **D'URBAN**, *dër-băn'*: chief port of the colony of Natal; lat.  $29^{\circ} 50'$  s., long.  $31^{\circ} 10'$  e. D. was founded 1842, and named after Sir Benjamin D., gov. of the Cape. It has railway communication with Pietermaritzburg, and with the coast. The number of vessels entered inward 1880 was 378 of 204,221 tons; cleared, 362 of 198,630 tons. An observatory has been erected here. Pop. of town and suburbs, (1881) 14,000, including 7,494 Europeans; a floating native population of 3,800, and an Indian pop. of about 3,000; (1900) pop. of bor. 48,410.

**DURBAR**, n. *dūr'bār* [Hind. *darbār*, an assembly]: an audience-hall in India; the court of a native prince; the formal reception of native princes, as at the court of a sovereign by the governor-general of India for political purposes. On 1903, Jan. 1, a Coronation Durbar was held in Delhi to recognize King Edward as emperor of India. Its estimated cost was £1,750,000.

**DURBHANGAH**, *dër-băn'ga*: capital of a dist. of the



## DURBIN—DÜRER.

same name in Bengal, India, province of Behar, Patna division. Pop. (1881) 65,955; (1891) 73,320.

**DURBIN**, *dër'bîn*, JOHN PRICE, D.D.: 1800–1876, Oct. 17; b. Bourbon co., Ky.: Meth. Episc. clergyman. He was apprenticed to a cabinet-maker when 14 years old, entered the itinerant ministry of the Meth. Episc. Church when 19, studied at Miami Univ. and graduated at Cincinnati College 1825, and soon afterward became prof. of languages in Augusta College, Ky. In 1831, he was chosen chaplain of the U. S. senate, 1832 was appointed editor of the *Christian Advocate and Journal*, 1834 elected pres. of Dickinson College, Penn., and held the office till 1845, and 1850–72 was sec. of the missionary society of the Meth. Episc. Church. He took an active part in the great slavery discussion in the gen. conference 1844, made two prolonged journeys to Europe in the interests of church missions, and besides contributions to religious and general periodicals, published *Observations in Europe, Principally in France and Great Britain* (2 vols. 1844), and *Observations in Egypt, Palestine, Syria, and Asia Minor* (2 vols. 1845).

**DURDUM**, **DIRDAM**, or **DIRDUM**, n. *dër'dŭm* [W. *dowrd*, noise]: in *Scot.* and *prov. Eng.*, a familiar name for a great noise or uproar.

**DUREN**, *dŭ'rĕn* (the Roman Marcodurum, whence its former name, Mark-Duren): ancient town of Rhenish Prussia, on the Roer, 18 m. e. of Aix-la-Chapelle. It is surrounded with walls, and has several churches remarkable for fine architecture. D. has important manufactures of woolen cloths, iron and steel ware, paper, soap, leather, oil, etc. In the vicinity are iron foundries and other factories worked by water-power, obtained from the Roer. Here Charlemagne, on his way to attack the Saxons, held diets in 775 and 779. After an obstinate resistance, D. was taken and burned by Charles V., 1543. In 1794 the French made it the cap. of the dept. of Roer; but in 1814 it was transferred to Prussia. Pop. (1880) 17,368; (1890) 20,702.

**DURENE**, n. *dŭ'rĕn* [L. *dŭrus*, hard]: an aromatic body obtainable from coal-tar, the only known hydrocarbon of the benzene series, solid at ordinary temperatures.

**DÜRER**, *dŭ'rĕr*, ALBERT: father of the German school of painting 'the prince of artists,' as his countrymen loved to call him: 1471–1528, Apr. 6; b. Nürnberg—born, according to an entry in his father's day-book, 'on the day of St. Prudentius, on a Friday of the holy week.' His father was a humble pious goldsmith, of whom the great painter said: 'His daily speech to us was, that we should abound in love to God, and act faithfully toward our neighbor.' D. was carefully educated and instructed by his father in the goldsmith trade, and at 15 years of age executed a piece of work in chased silver representing the seven 'falls of Christ'—in reference to the tradition that Christ fell seven times while bearing His cross to Mount Calvary. Even as a child, drawing was his delight, and he was wont to astonish by the exactness with which he drew parts of the



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human body, and even whole figures, also lines and circles at the first strokes, without ruler or compass. His father therefore bound him apprentice 1486 to Michael Wohlge-muth, the chief Nürnberg artist, with whom he served three years. From 1490 to '94 he travelled in Germany and the Venetian states; and on his return, his father 'bar-gained' with Hans Frei, a skilful mechanic of Nürnberg, to give Albert to wife his daughter Agnes, who turned out a perfect Xantippe, with nothing to recommend her but beauty and 200 norins. She embittered the whole course of his life, and, as his life-long friend Pirkheimer asserts, hastened his death. After receiving his diploma with all the honors and rights of a master, obtained for his famous drawing of Orpheus, he went to Venice 1505, where he painted a picture of the martyrdom of St. Bartholomew, and one of Adam and Eve, afterward bought for the gal- lery at Prague. He also visited Bologna, where it is said that he met Raphael, who esteemed him highly, and that each painted for the other his portrait. After this journey, his fame spread widely; and the Emperor Maximilian ap- pointed him court painter, with an annuity of 100 florins; and Charles V. confirmed the same in a document still in the Nürnberg archives. In 1520, he visited the Nether- lands with his wife and their maid servant; and they were splendidly entertained at Antwerp and Bruges by the painters, a costly dinner being served on vessels of silver, the whole party conducting them home late in the night by the light of many torches. His expenses were often defrayed at the inns, and he was escorted free from city to city. He says in his journal: 'The people did obeisance unto me as if they were leading some great lord.' D. warmly em- braced the doctrines of the Reformation; and his journal contains a long lamentation and prayer on hearing that Luther had been carried off to the castle of Wartburg. At Antwerp he records: 'I was now overcome by a strange sickness, of which I never yet heard from any man.' This was in 1521, and the 'strange sickness'—no other than consumption—took yet seven years to consume his strong frame; he died in his native city, in his 57th year.

D's facility was almost incredible. He *thought out* his works, and then executed them without sketch, and never altered a line. Of his coloring Fuseli says: 'Dürer ex- celled Raphael in juice and breadth of coloring as much as Raphael excelled him in every other quality.' His drawing was perfect. So quaint were the presentments of his genius, he may be called the Chaucer of painting. In his portraits, he not only caught the expression, but delineated character and passion. D. was the inventor of the art of etching. He found wood-engraving in its infancy, and raised it to be a pattern for all times; he also discovered the method of bringing out wood-cuts in two colors. Historical and other paintings by D. are at Vienna, Munich, Prague, Dresden, and Nürenberg. The oldest of his pictures extant is the portrait of himself of the year 1498, in the Florentine Gallery. His engravings and wood-cuts are so numerous, that with all his surpassing diligence it

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is known that for many of them he gave only the designs: 262 wood-cuts are known marked with his name, the most famous of which are the *Great Passion*, the *Little Passion*, his favorite work the *Revelation of St. John*, and the series called the *Triumph of Maximilian*, a copy of which is in the Advocates' Library in Edinburgh. In the British Museum, there is a volume with more than 200 original drawings by D., formerly in the collection of Sir Hans Sloane, also an exquisite carving in hone-stone, of the Birth of St. John, and a number of engravings, bequeathed by Mr. Nollekens. His own list of his works enumerates 1,254 pieces.

In the last three years of his life he published works on perspective and measurement, on fortification, and on human proportion, of which last he lived long enough to correct only the first volume. See the lives by Heller, Roth, Campe, Thausing (transl. by Eaton 1882); in English by W. B. Scott, Mrs. Heaton, and Heath. Deeply religious and reverent, he was also of a cheerful temperament, and was long chief magistrate of his native town, where there is a brass statue of him, designed by the famous sculptor Rauch, and his house is still seen at the corner of a street called by his name.

**DURESS**, n. *dū-rēs'* or *dūrēs* [OF. *duresse*—from L. *duritiā*, hardness—from *dūrus*, hard]: constraint, actual or threatened; imprisonment; restraint of liberty; in *law*, the plea of one who has obliged himself to pay or to perform—or of one who has committed a misdemeanor—that he was compelled to do so and should therefore be free from legal responsibility. D. may be by imprisonment, or by threat. A bond signed under D. may be voided at law. D. applies also when the force or threat is exercised on any near of kin to a person to compel his action. The violence in D. must have been such as to cause fear in one of ordinary firmness.

**D'URFEY**, *dér'fe*, THOMAS: writer of plays and poems in the reign of Charles II., with whom he was a favorite for his wit, liveliness, and songs: d. at advanced age, 1723. In literature, he is remembered best for his collection of songs, entitled *Pills to Purge Melancholy*, of which a fac-simile reprint was issued 1872. Addison was his friend.

**DURGA**: see DOORGA.

**DUR'GA PU'JA**: see UMA.

**DURHAM**, *dūr'ām*: city, cap. of Durham co., N. C.; on the Southern and Seaboard Air Line and the Norfolk and Western railroads. It has extensive tobacco manufactories, including chewing and smoking tobacco, snuff, cigars, and cigarettes; 12 churches, a seminary for young ladies, daily and weekly newspapers, and water-works. Near D. the surrender of Gen. Joseph E. Johnston, of the confederate army, occurred, 1865. Among the industries is the manufacture of a fertilizer consisting largely of tobacco. Pop. (1880) 2,041; (1890) 5,485; (1900) 6,679.

**DUR'HAM**: maritime county in the n.e. of England, between Tyne and Tees. It has 32 m. of coast, generally low, but with some cliffs; area 1,012 sq. m. five-sevenths



## DURHAM.

arable. The surface is hilly, and slopes to the east. In the west, which is waste but rich in minerals, are branches of the Pennine chain, rising in Kilhope Law, 2,196 ft; Colber Law, 1,678; and Pontop Pike, 1,018. The two chief branches enclose the valley of the Wear, and send forth several parallel ranges, declining toward the coast, and inclosing many fertile tracts and sheltered valleys. The chief rivers are the Wear, Tyne, and Tees, navigable respectively for 12, 15, and 10 m. The rocks are new red sandstone, magnesian limestone, millstone grit, carboniferous limestone, rich in lead; and coal-measures, forming the valuable D. coal-field, 25 by 10 m., with many faults, and with about 40 beds of coal, three to ten ft. thick. Basalt and greenstone trap dikes intersect the w. part of D. The mineral products are coal, limestone, black marble, freestone, ironstone, firestone, slate, millstone, grindstone, and lead. Large furnaces for the production of iron are in operation in various parts of the county. D. is one of the chief counties in England for the production and export of coal: 500 ships, besides a fleet of steamers, are employed at Sunderland for this export alone. There are 240 collieries. Five of the coal-seams, at the depth of 20 to 100 fathoms, are worked horizontally for many miles: 212 m. of railway connect the mines and ports. The soil is a clayey or dry loam. The chief crops are oats, barley, wheat, turnips, beans, and pease. The Teeswater or Holderness breed of cattle is famed for fattening, quantity of milk, and early maturity: see Ox. The D. horses are famed for draught and the saddle. Many sheep are pastured on the hills. There are manufactures of iron, pottery, glass, alkalies, and chemicals, and salt, and much shipbuilding at Sunderland, South Shields, Jarrow, Hartlepool, and Stockton. Coal is the chief export. D. is divided into 4 wards, 15 poor-law unions, and 60 parishes, many of which have been subdivided, owing to the increase of population. The chief towns are Durham, the county town, Sunderland, Darlington, Gateshead, South Shields, Stockton, and Hartlepool. The county sends eight members to parliament. D. has some ancient barrows, and has afforded many Roman antiquities, as altars, urns, and coins. There are remains of a fine Roman station at Lanchester. D. formed part of the Saxon kingdom of Northumbria (547-827). Subsequently, it suffered severely from the incursions of the Scots.—Pop. (1861) 508,666; (1871) 685,089; (1881) 867,586; (1891) 1,016,449; (1901) 833,614.

DURHAM COUNTY PALATINE, one of the three counties palatine of England, the other two being Lancaster and Chester. For the privileges of a county palatine, see PALATINE. The county palatine of Durham existed by prescription. It was the only county palatine in the hands of a subject, and belonged to the p. of Durham. By 6 and 7 Will. IV. c. 19, the county palatine of Durham is separated from the bishopric, and vested in the crown.

DU'RHAM, *dér'am*: parliamentary and municipal borough, and ancient episcopal city of England, near the middle of Durham co., built around a steep rocky hill 86 ft. high, nearly encircled by the Wear. On the top of the



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hill are the cathedral and castle. Ancient walls partly inclose the hill, from which are fine views of the fertile wooded country around, and of the suburbs across the river. The chief manufactures are mustard, carpets, paper, and iron. In the vicinity are coal-mines, and saline, chalybeate, and sulphureous springs. It sends one member to parliament. D. arose about 995, when Bp. Aldune brought here St. Cuthbert's bones from Ripon, and built a church to enshrine them. On the site of this church, Bp. William de Carilepho, about 1093, began the present magnificent cathedral, a Romanesque structure in the form of a Latin cross, to which additions continued to be made till about 1500. It thus exhibits the gradual changes of style between these periods. It was restored during last c., and has lately undergone extensive renovation. It is 507 by 200 ft., with a central tower 214 ft. high, and two w. towers 138 ft. high. For plan of it, see CHURCH. The cathedral contains many old monuments. Here lie St. Cuthbert's (q.v.) remains. Here also are Bede's tomb and some manuscripts said to be in his hand-writing. Cardinal Wolsey was a prelate here. The bishop's income is now £8,000. The castle, formerly the residence of the bishops of D., now the seat of the Univ. of D., was founded about 1072, by William the Conqueror, in the Romanesque style, but it has since been much altered. The dormitory, now the new library of the cathedral, which belonged to the monastery of D., is one of the finest in England. Two of the bridges over the Wear were erected in the 12th c. D. was often attacked by the Scots.

A college was founded here 1290 by the prior and convent of Durham. It was abolished, however, at the dissolution of monastic houses in the reign of Henry VIII., and its endowments given to the dean and chapter of Durham. Under the Commonwealth, Cromwell instituted a college here, and endowed it with the sequestered revenues of the dean and chapter, to whom, however, these revenues reverted at the Restoration, when the college was suppressed. The present Univ. of D. was opened for students 1833, under the provisions of an act of parliament, obtained by the dean and chapter during the previous year. A royal charter, 1837, empowered the univ. to bestow degrees. The D. Univ. comprises professorships in divinity and ecclesiastical history, classical literature, mathematics and astronomy, and medicine, with lectureships in Hebrew, classical literature, and mathematics, with several tutors and other teachers. It has two colleges—University College, and Bishop Hatfield's Hall. At Newcastle-on-Tyne, but in connection with the univ., are the well-known Colleges of Medicine and of Physical Science.—Pop. of D. (1881) 14, 932 ; (1891) 14,863.

DURHAM, JOHN GEORGE LAMBTON, Earl of: 1792, Apr. 12—1840, July 28; b. Lambton Hall, co. Durham, England; son of William Henry Lambton. The Lambton estate was not very large, but had been in the possession of the family since the 12th c., the male issue having never failed during all that period. The antiquity of the family, however,

## DURIAN--DÜRKHEIM.

exercised no narrowing influence on D.'s opinions, which were markedly radical. He was educated at Eaton; and when only 20 years of age, married at Gretna Green Miss Harriet Cholmondeley, who died after a few years. In 1814, he represented his co. in parliament, and though he did not speak on many questions, he took part in all the more important debates, opposing the Corn-law Bill of 1815, the additions made to the incomes of the royal dukes, the Indemnity Bill of 1818, the six repressive bills brought in by govt. to coerce the people after the great reform meeting at Manchester 1819, etc. Two years later he submitted to the house of commons a scheme of parliamentary reform, which of course was not accepted. In 1828, he was raised to the peerage, with the title of Baron D. of the city of Durham. He was one of the four persons who drew up the Reform Bill, and supported it in the house of lords. In 1833, Lord D was dispatched on a mission to Russia. On his return to England, Lord D's 'advanced liberalism' was proclaimed at a dinner given to Lord Grey at Edinburgh, 1834, and in various other parts of the country. After a second mission to Russia, he was appointed gov.-gen. of Canada, where he arrived 1839, May; but on account of a misunderstanding with the home govt., he took the extraordinary step of returning to England in half a year, without either being recalled or obtaining the royal consent. D. died at Cowes, Isle of Wight, leaving a son who succeeded him as Earl of D., and three daughters.

**DURIAN**, or **DURION**, *dū'rĭ-ŭn* (*Durio zibethinus*): fruit-tree of the Malayan Archipelago, of the nat. ord. *Sterculiaceæ*, of the same tribe or sub-order (*Bombaceæ*) with the silk-cotton tree. It is a lofty tree, with leaves resembling those of the cherry, and large bunches of pale-yellow flowers. The fruit is of the size of a man's head, roundish oblong, with a hard thick rind, covered with soft spines, so that it somewhat resembles a hedgehog rolled up. The pulp of the fruit is of a sort of creamy substance and delicious taste, but has a smell which is at first very repulsive to Europeans. Persons accustomed to it, however, universally regard the D. as one of the very finest fruits of the East. It brings a higher price than any other fruit in the market in India. It contains 10 or 12 seeds, as large as pigeons' eggs, which, roasted, are not inferior to chestnuts. One tree yields about 200 durians in a year.—The cultivation of the D. has not yet been successful in European and American hothouses, the great size of the tree forming one principal obstacle to it. The D. is not a native of India, nor of Ceylon, but is now successfully cultivated in the latter country.

**DURING**, prep. *dū'rĭng* [L. *dūrō*, I last or continue]: holding on; in the course of; while anything lasts.

**DÜRKHEIM**, *dürk'hĕim*: town of Rhenish Bavaria, six m. s.w. of Mannheim, at the base of the Hardt Mountains. Many invalids resort to D. on account of its amenity, and to take the *grape-cure*. It has manufactures of tobacco,

## DURLACH—DURRA.

cutlery, and paper. Not far off are the salt-works of Philipshall. Pop. (1880) 6,089; (1890) 6,081.

DURLACH, *dūr'lách*: old town of Germany, grand-duchy of Baden, on the river Pfinz, at the base of the Thurmberg, a highly cultivated hill, 3 m. e. of Carlsruhe. D. manufactures linen, tobacco, chicory, vinegar, and machinery, and has extensive fruit and grain markets. The environs abound with orchards. On the summit of the Thurmberg are the ruins of an old castle. D. is a station on the Mannheim and Basel railway. Pop. (1880) 7,474; (1890) 8,240.

DUROMETER, n. *dūr-öm'ě-tér* [L. *durus*, hard; Eng. *meter*]: an instrument invented by Behrens, designed for testing the relative hardness of steel rails.

DUROY, n. *dū-roy'*: a common quality of woolen serge.

DURRA, *dūr'ra* (*Sorghum vulgare*): called also *Doura*, *Indian Millet*, *Guinea Corn*, *Ivory Wheat*, *Pampas Rice*, *Egyptian Corn*, and various other names. The species is divided into an almost endless number of varieties. Durra bears the smallest grains of the cereals cultivated for food. It is a native of the warmer portions of the old world, and has been under cultivation from time immemorial. The people of central India, Arabia, and large portions of Africa use it as their principal food. Under favorable conditions it throws up large and tall stalks with many broad leaves and large panicles. It has been spread to nearly all parts of the globe, but succeeds best where the summers are long and comparatively dry.

D. has been known in this country about three-quarters of a century. At intervals of a few years it is described in glowing circulars, under a new name, as a most valuable grain and forage plant, and unwary purchasers pay high prices for the seed. At some periods it has created considerable interest among practical farmers, and enthusiastic admirers have claimed that it would supplant Indian corn; but its popularity has usually been short-lived and its cultivation has never become general.

To a considerable extent D. adapts itself to circumstances. It grows on a great variety of soils, and in widely different climates, though in our northern states it does not always ripen its seed. In a remarkable degree it has the power of withstanding drought, but on account of the compact nature of the heads it is liable to be injured by rain at harvest time. The seed should be lightly covered, particularly in moist land, or it will be liable to decay. For a while the plant is feeble and needs careful cultivation, but when fairly started it grows rapidly and soon shades the ground so as to smother weeds. Either in a green or dry state the stalks and leaves make excellent fodder. The grain weighs about 60 lbs. per bushel, and 20 to 80 or more bushels can be obtained from an acre of good land. The feeding value of the grain is about the same as that of Indian corn. On account of its heavy growth and the weight of the heads it is more difficult to harvest than other grain.



## DURST—DURYEE.

It must be cut as soon as ripe, or it will shell profusely in the field. The white varieties yield the largest grain, and are the most popular. The brown or red sorts are little, if any, superior to the seed of brown corn, to which they bear a very close resemblance. Flour made from D. is said to be better for cakes than buckwheat, but inferior to either wheat or corn for making bread. In this country it is not desirable as a plant for human food, but it may be profitably grown for cattle. The Chinese sugar-cane (see SUGAR-CANE) (*S. saccharatum*) is cultivated to quite an extent at the north for syrup and sugar, also for forage.

DURST, *v. dērst*: see DARE.

DURUY, *dü-rü-ē'*, JEAN VICTOR: 1811, Sep. 11—1894, Nov. 25; b. Paris; historian. Originally meant to be a designer in the lace-works at Gobelins, he showed singular aptitude for learned studies, entered the École Normale in his 19th year, and 1833 was a prof. in the college of Henri IV., Paris. In 1863 he was made minister of public instruction, and carried out some important reforms. He was author of numerous important works of history and geography. Among the more important are historical geographies of the Roman Empire, of the Middle Ages, and of France; great histories of Rome, of France, and of Greece; and Sacred History. These works, published 1838–52, appeared partly as sections of the series of works on Universal History of which he was editor. He published numerous minor works; resigned his post 1869; and was made a senator. He held all the distinctions of the Legion of Honor, and was elected to the Academy 1885.

DURYEA, *dūr-yā'*, JOSEPH TUTHILL, D.D.: 1832, Dec. 9—1898, May 17; b. Jamaica, N. Y.; Congl. minister. He graduated at Princeton Coll. 1856, was tutor of Greek and rhetoric there 1857–8, graduated at Princeton Theol. Sem. 1859, was immediately called to the second Presbyterian Church at Troy, N. Y., where he preached till 1862, was an assoc. pastor of the Collegiate Ref. Church, New York, 1862–68, pastor of the Classon Ave. Presb. Church, Brooklyn, 1868–79, of the Central Congl. Church, Boston, 1879–89, First Congl. Church, Omaha, Neb., 1889. He had a fine philosophical mind, and wide scholarship.

DURYEE, ABRAM: 1815, Apr. 29—1890, Sept. 27; soldier; b. New York, of Huguenot ancestry. Trained to a mercantile life in New York, he early interested himself in military affairs, joined the state militia 1833, and 1838 became a member of the 27th regt., afterward the celebrated 'Seventh,' of which he was made col. 1849, holding the office 14 years. At the outbreak of the civil war he raised a regt. called in his honor 'Duryee's Zouaves,' which was succeeded by a second regt. under the same name, both organizations distinguishing themselves during the war.

DURYEE, WILLIAM RANKIN, D.D.: 1838, Apr. 10—1897, June 20; clergyman of the Reformed church: b. Newark, N. J. He graduated at Rutgers College 1856, and at New Brunswick (N. J.) theol. seminary 1861; and was ordained 1862 pastor of the Reformed chh. in Bergen, N. J.

## DURYLIC ACID—DÜSSELDORF.

Immediately after ordination he entered the Union army as chaplain, and at the end of that service took the pastorate of a Reformed church in Jersey City, N. J. In 1891 he became prof. of moral philos., ethics, and the Eng. Bible in the theol. seminary of the Reformed church, New Brunswick, N. J. He published *Sentinels for the Soul* (1862); and *Our Mission Work Abroad* (1876).

**DURYLIC ACID**, n. *dū-rīl'ik*:  $C_6H_2(CH_3)_3 \cdot CO_2 H$ , a monatomic monobasic acid obtained by oxidizing durene,  $C_6H_2 \cdot (CH_3)_4$ , with dilute nitric acid. It crystallizes in hard prisms, which melt at  $302^\circ$ . By further oxidation, it is converted into cumidic acid,  $C_6H_2(CH_3)_2(CO_2H)_2$ , which crystallizes in long transparent prisms, and sublimes at high temperatures.

**DUSICYON**, *du-sīs'ī-on*: genus of *Canidæ*, or sub-genus of *Canis* (dog), consisting of a number of S. American species or varieties, sometimes called Aguara dogs. They have the body rather long in proportion to their height, and of considerable bulk, the muzzle rather sharp, eyes somewhat oblique, and aspect somewhat foxlike, the tail also has a more or less perfect foxlike brush. They are more diurnal than nocturnal in their habits, live in burrows, and feed on birds and small quadrupeds. Some have been domesticated by the Indians.—Akin to the Aguara dogs, but more foxlike, are the Aguara foxes (*CERDOCYON*, q.v.).

**DUSK**, n. *dŭsk* [from Eng. *dull*: Sw. *dusk*, dull weather: Dan. *dulsk*, dull, lifeless: Icel. *doska*, to dawdle, to delay]: a tending to darkness; twilight; state between light and darkness: **ADJ.** moderately dark; tending to darkness. **DUS'KISH**, a. moderately dark. **DUS'KISHLY**, ad. -*lī*. **DUS'KILY**, ad. -*kī-lī*, with partial darkness. **DUS'KINESS**, or **DUS'KISHNESS**, n. approach to darkness. **DUS'KY**, a. -*kī*, partially dark; obscure; gloomy; overcast. **DUSKY-PERCH**, n. in *ich.*, a species of perch, *Senanus gigas*, belonging to the genus *Senanus*, found on the coasts of France and Spain and in the Mediterranean, where it sometimes reaches a weight of 60 pounds. The color of the back is a dark reddish-brown, becoming paler on the belly. Both jaws have very distinct canine teeth.

**DUSKY BAY**, *dŭsk'ī*: large inlet on the s.w. coast of Middle Isle, New Zealand; lat.  $45^\circ 40'$  s., and long.  $166^\circ 20'$  e. It was entered by Capt. Cook 1769, who here found good anchorage.

**DÜSSELDORF**, *dŭs'sel-dŏrf* or *dŭs'sel-dŏrf*: chief town of the dist. of D., Rhenish Prussia, and cap. of the former duchy of Berg; in a fertile district, on the right bank of the Rhine, at the confluence of the Düssel; lat.  $51^\circ 13'$  n., long.  $6^\circ 45'$  e. It was formerly fortified, but its ramparts were converted into gardens and promenades at the treaty of Luneville, 1802. It is in the midst of extensive garden-grounds, and is well built. The streets, the houses of which are built of brick, are regular and spacious; while the rows of trees with which many of them are planted, greatly enhance their appearance. D. is divided into the *Altstadt*,



## DUST.

on the right bank of the Düsseldorf; the *Karlsstadt*, founded 1786 by the Elector Karl Theodore, on the left bank; the *Neustadt*, on the Rhine; and the recently built *Friedrichstadt*, to the south. A colossal equestrian statue of the Elector Johann Wilhelm, who founded a famous picture-gallery here 1710—the pictures of which, however, were removed to Munich 1805—stands in one of the five squares of Düsseldorf. The D. Acad. was founded 1767, reorganized 1822, and attained great eminence 1822–26, under the management of Cornelius and Schadow. It has had great influence in Europe and the United States: in America its leading exponents have been George H. Hall, Eastman, Johnson, Bierstadt, Leutze; in Germany, Achenbach, Lessing, Tide-mann, Baur, Knaus. The acad. has a collection of 14,000 original drawings and sketches by the great masters, and 24,000 engravings. An art exhibition and a steel and iron exhibition were held in D. 1880. The principal buildings of D. are the old electoral palace; the present palace, the residence of the gov. of the province; the govt. house, the observatory, town-hall (built 1567), theatre, gymnasium, and public library. Of the ecclesiastical edifices, the most remarkable are the churches of St. Andrew and St. Lambert, and the church of the Jesuits, a handsome and highly ornate structure, having two steeples. The Hofgarten, one of the finest public gardens in Germany, is a very agreeable promenade. D. has manufactures of woollens, cottons, leather, hats, tobacco, jewellery, mirrors, railway-carriages, etc., and its trade and industries generally are steadily advancing. A great part of its importance may be said to be derived from its position on the Rhine, where it receives great quantities of goods from the surrounding districts for exportation. With the duchy of Berg, D. came into the possession of Prussia 1815. It was made a free port 1829, and since that time it has prospered. Industry and commerce have received a new impulse since D. became the central point of several lines of railway. Pop. (1880) 95,458, mostly Roman Catholic; (1900) 213,767.

DUST, n. *düst* [Icel. *dust*; Gael. *dus*, dust: Dan. *dyst*, fine flour, meal: Dut. *donst*, vapor, flour: Ger. *dunst*, vapor]: particles of matter so fine and dry that they may be raised and scattered by the wind; fine powder; earth; mortality; death; a low or mean condition: V. to free from dust; to sprinkle with flour or powder. DUST'ING, imp. DUST'ED, pp. DUST'ER, n. one who, or that which; a towel or napkin for dusting: N. a light overcoat worn to protect the clothes from dust; a dust-coat. DUSTY, a. *düst'ti*, covered with dust; pertaining to dust; in *bot.*, covered with minute dots, as if dusted, as the calyx and corolla of *Ardisia lentiginosa*. DUS'TINESS, n. -*nēs*, state of being dusty. DUST-BIN, a receptacle for the temporary disposal of dust, ashes, and refuse. DUST-BRAND: see SMUT. DUST-BRUSH, a light feather or hair brush for removing dust from furniture, etc. DUST-CART, a cart employed to take away rubbish and refuse from dwelling-houses. DUST-HOLE, an ashpit. DUST-MAN, a scavenger; one employed to take away dirt and refuse. DUST-PAN, a



## DUST.

broad flat shovel for taking away dust from an apartment. **DUSTY-MILLER**, or **DUSTY-MILNER**, n. in *bot.*, *Primula auricula*, from its white powdery appearance. To **BITE THE DUST**, to fall or be thrown, as in a contest or battle; to suffer humiliation. To **KICK UP A DUST**, in *familiar language*, to make a disturbance. To **THROW DUST IN ONE'S EYES**, to confuse; to bewilder; to deceive.

**DUST**, **COSMIC** or **METEORIC**: fine particles filling vast regions of the atmosphere. The constant presence of dust in the air may be demonstrated by the familiar experiment of admitting a beam of sunlight into a dark room. The path of the beam becomes plainly visible owing to the reflection of the light by the myriad particles floating about. Were the air quite pure, of course nothing of the kind would be seen. To prove that dust exists also in the open air, if we cover a plate with a thin coating of glycerine and expose it to a strong wind, numerous particles of matter will be found deposited on its surface. Examined with the microscope, these prove to be pollen-grains from flowers, bits of vegetable fibres and hairs, mineral and rocky fragments of all kinds, and *iron*. The presence of vegetable and mineral particles is easily explained; but not so the iron.

Showers of dust are not uncommon near active volcanoes. Mr. Whymper witnessed an eruption of Cotopaxi, in which dust and ashes calculated to weigh about two million tons were thrown into the air. But dust-showers of other than volcanic origin have frequently been observed both in ancient and in modern times. Nordenskjöld found particles of metallic iron and nickel in the snow at Stockholm in 1871, on the Polar ice, and in 1883 in Greenland. Hail-stones have sometimes been found to have a metallic nucleus of iron pyrites. Glycerined plates exposed to the winds have had iron particles deposited on them. Dr. Reichenbach, of Vienna, has shown that the dust which covers the tops of mountains and other elevated places contains metallic particles. Magnetic dust was found by Mr. Murray, of the *Challenger*, in the dredgings of the sea-bottom. According to Professors Newton and Young, 100 tons of meteoric stones on an average are daily dissolved to dust in our atmosphere.

Arago said in 1832: 'The attentive observation of falls of dust renders it presumable that they are not essentially different from those of the ordinary aërolites.' In this opinion he has been followed by Reichenbach, Nordenskjöld, Silvestri, and Tissandier:

The main argument for the cosmic or extra-terrestrial origin of such dust is the similarity of its composition to that of meteoric stones (aërolites), though sometimes the dust differs materially from the constituents of an aërolite. Another reason is, that the fall both of aërolites and of showers of non-volcanic dust seems generally preceded by a fireball or luminous meteor. Many of the best authorities, believe that *comets* are the source of our meteoric phenomena—shooting-stars, fireballs, aërolites, and (if the theory above noted be true) meteoric or cosmic dust.

## DUSTEE—DUTCH.

Meteors seem to be due to the earth passing through rings of matter which revolve round the sun in cometary or elliptic orbits, the larger masses of this matter reaching the earth as aërolites, and the smaller ones being frittered into dust by the resistance of the air. See METEORS.

A contrary opinion is adopted by Prof. Tacchini of the Collegio Romano in Rome, who has analyzed the dust which fell in various parts of Sicily and Italy 1879. The dust was borne on the sirocco, a dry wind from the African desert. The examination revealed the presence of the usual constituents—as granules of metallic iron, nickel, cobalt, phosphorus, magnesia, etc. His theory is: Whirlwinds and cyclones in the Sahara raise quantities of dust into the higher regions of the atmosphere; it there remains suspended for several days until transported across the Mediterranean; then a small descending cyclone—the cause of the barometric depression—brings it to the surface of the earth. And he thinks that Nordenskjöld's discovery of native iron in Greenland justifies the belief that it may occur in the dust of the Sahara. But no supporter of the theory of terrestrial origin for the dust has explained the fact that the iron particles found in it are particles of meteoric iron as distinguished from any terrestrial iron known to us. Meanwhile, therefore, the cosmic origin seems most probable.

DUSTEE, *dós'tē*: largest river of Beloochistan, enters the Arabian Sea, in lat. 25° 3' n., and long. 61° 45' e. In proportion to length, it is certainly the least considerable stream in existence. It is about 1,000 m. long; and yet it has been found to be, at its mouth, 20 inches deep, and 60 ft. wide. During its entire course, it is, in its permanent character, remarkably shallow; and, in fact, all the water-courses of the country depend almost exclusively on the rainy season.

DUSTY-FOOT: court of summary jurisdiction established at fairs in England for the speedy determination of questions arising between those who resorted to the fair: see PIEPOWDER COURT.

DUTCH, v. [etym. doubtful]: to clarify and harden by immersing in heated sand as goose-quills. DUTCHING, n.

DUTCH, a. *dūch* [Ger. *deutsch*—*lit.*, belonging to the people]: pertaining to Holland—its language or inhabitants; in many compounds. false, unreal. DUTCH-AGRIMONY, in *bot.*, *Eupatorium cannabinum*. DUTCH-AUCTION a false or mock auction in which the salesman begins with a high sum, gradually naming less sums till the minimum is reached. DUTCH-BEECH, n. in *bot.*, *Populus alba*. DUTCH CASE, n. in *mining*, a shaft-frame composed of four pieces of plank, used in shafts and galleries; a mining-case. DUTCH-CLINKERS, long narrow bricks from Holland, very hard, and appearing as if vitrified. DUTCH CLOVER, n. in *bot.* *Trifolium repens*, also called white clover. DUTCH CONCERT, n. a so-called concert in which every man sings his own song at the same time that his neighbor is also singing his. There is another form of Dutch concert, in which each person

## DUTCH REFORMED CHURCH—DUTIES.

present sings in turn one verse of any song he pleases, some well-known chorus being used as a burden after each verse. When every person has sung his song, all sing their respective songs simultaneously as a grand *finale*. **DUTCH-COURAGE**, courage excited by stimulants. **DUTCH-GOLD**, alloy of copper and zinc, in the proportion of three or four ounces of zinc to one pound of copper. It can be beaten out into thin leaves resembling gold-leaf, when it receives the name of *Dutch gold-leaf*, or *Dutch-foil*, and almost rivals gold in appearance. Dutch-gold, called sometimes *Dutch-mineral* or *-metal*, is very liable to be tarnished by gases, such as hydrosulphuric acid (sulphureted hydrogen), which are constantly present in the air, especially in town districts, and it may be distinguished from true gold-leaf by the action of strong nitric acid, which instantly dissolves Dutch gold, but leaves true gold unaffected. **DUTCH-LIQUID**, oily substance obtained by mixing chlorine and olefiant gases, which combine and yield Dutch-liquid with the formula  $C_2H_4Cl_2$ . It has a specific gravity of 1280 (water = 1000), boils at  $184^{\circ}$  F., is not miscible with water, but dissolves readily in ether and alcohol. It possesses the power of producing anæsthesia (q.v.), as chloroform (q.v.) does; but the great difficulty of preparing it in commercial quantities must retard its employment as an anæsthetic. **DUTCH MEDLAR**, n. in *bot.*, *Mespilus germanica*. **DUTCH MICE**, n. in *bot.*, *Lathyrus tuberosus*. **DUTCH MORGAN**, n. in *bot.*, *Chrysanthemum leucanthemum*. **DUTCH MYRTLE**, n. in *bot.*, *Myrica Gale*, a fragrant shrub belonging to the order *Myricaceæ*. It is found in bogs and moors, and is in some parts used for making an infusion like tea. **DUTCH OVEN**, n. a spider, skillet, or camp oven used to cook by hot coals on the hearth; a cooking-chamber suspended in front of a fire so as to cook by radiation. **DUTCH PINK**, n. chalk or whiting dyed with a decoction of birch-leaves, French berries, and alum. Dutch pink, English and Italian pinks, are bright yellow colors used in distemper and for paper staining and other ordinary purposes. The pigment called 'stil' or 'stil de grain' is a similar preparation, and a very fugitive yellow, the darker kind of which is called brown pink. **DUTCH ROOTS**, n. in *bot.*, *Hyacinthus nutans*. **DUTCH-RUSHES**, the stems of *Equisetums* imported from Holland, used for polishing: see **EQUISETUM**.—**DUTCH LANGUAGE AND LITERATURE**: see **NETHERLANDS**. **DUTCH SCHOOL OF PAINTING**: see **PAINTING**. **DUTCH SCOOP**, n. a box shovel suspended by cords from a tripod and used for irrigation. **DUTCH WHITE**, n. in *com.*, a mixture of lead carbonate and barium sulphate, sold as a white pigment.

**DUTCH REFORMED CHURCH**: see **REFORMED CHURCH IN AMERICA**.

**DUTEOUS**, a. *dū'ti-ūs* [from **DUTY**, which see]: obedient; fulfilling duty. **DU'TEOUSLY**, ad. *-lī*. **DU'TEOUSNESS**, n. *-nēs*. **DUTIFUL** (see **DUTY**).

**DUTIES, CUSTOMS**:- see **CUSTOMS-DUTIES**: **FREE-TRADE**: **TARIFF**, **PROTECTIVE**: ETC.



## DUTROCHET—DUYCKINCK.

**DUTROCHET**, *dü-tro-shā'*, RENÉ JOACHIM HENRI: 1776, Nov. 14—1847, Feb. 4; b. at the Château de Néon (Poitou); French physiologist and physician. His works are full of new ideas, but is known best by his researches on the passage of fluids through animal and vegetable substances: see **ENDOSMOSE: DIFFUSION OF LIQUIDS AND GASES**.

**DUTTEEAH**, *dūt'té-a*: city of Bundelcund, central India, 125 m. s.e. of Agra. Pop. abt. 30,000.

**DUTY**, n. *dū'tī* [from Eng. *due*: It. *dovuto*; OF. *deuté*, duty, right: F. *dū*, duty]: the obedience which one owes to another, as to a parent or superior (see **ETHICS**) that which a person is bound to pay, do, or perform; tax, impost, or toll, service; business. **DUT'IA**BLE, a. *-ā-bl*, in *commerce*, liable to duty or duties. **DUT'IFUL**, a. *-fūl*, respectful; obedient, as to parents or superiors; required by duty. **DUT'IFULLY**, ad. *-lī*. **DUT'IFULNESS**, n.—**SYN.** of 'duti-ful': obedient; submissive; duteous; reverent; reverential; deferential.

**DUUMVIR**, n. *dū-ūm'vīr*, **DUUM'VIRI**, n. plu. *-vīr-ī* [L. *dūō*, two; *vīr*, a man]: in *anc. Rome*, one of two united in the same public office appointed usually for some special magistracy or command. **DUUM'VIRATE**, n. *-vī-rāt*, two men united in the same office; the office itself. **DUUM'VIRAL**, a. *-vī-rāl*, pertaining to a duumvirate.

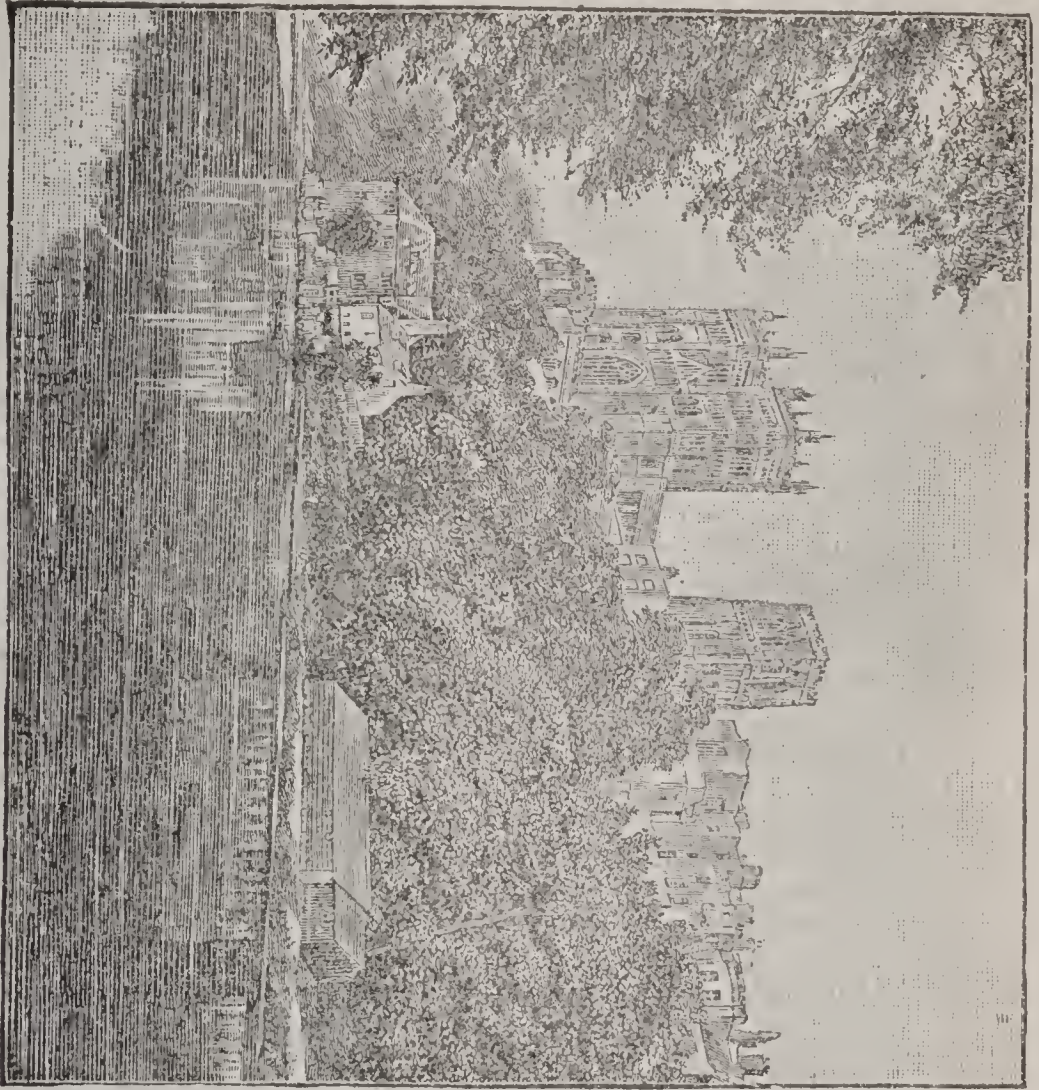
**DUVET**, n. *dó'vet* [F. *duvet*, down, wool, nap]: a down coverlet or quilt.

**DUX**, n. *dūks* [L. *dux*, a leader]: in *Scot.*, the head or chief pupil of a class or division, in a public school.

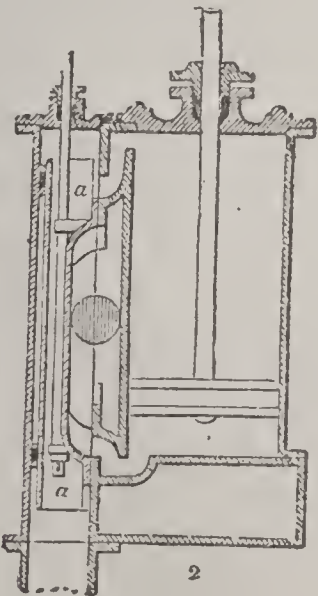
**DUXBURY**, *dūks'bēr-ī*: town, Plymouth co., Mass.; 9 m. n. of Plymouth, 27 m. s.s.e. of Boston; on a bay of the Atlantic Ocean, at junction of Old Colony and D. and Cohasset railroads. Gurnet peninsula, 6 m. long, forms the n.e. boundary of the harbor, and has two fixed lights at its extremity. The ocean cable from Brest, France, terminates here. D. was the residence of the Puritan soldier, Miles Standish, and has a hill 180 ft. high bearing his name. It contains Partridge Acad., abt. 12 public high and grammar schools, and several churches. The inhabitants are engaged in gen. commerce, fishing and ship-building. Pop. (1870) 2,341; (1880) 2,196; (1890) 1,908; (1900) 2,075.

**DUXITE**, n. *dūks'īt*: a resin occurring in a small layer 25 to 75 millimetres thick, on the lignite of Dux in Bohemia.

**DUYCKINCK**, *dī'kīnk*, EVERT AUGUSTUS: 1816, Nov. 23—1878, Aug. 13; b. New York: author. He graduated at Columbia College 1835; was admitted to the bar 1837; was joint editor and publisher of *Arcturus*, a monthly periodical, 1840–42; conducted with his brother *The Literary World* 1847–53; compiled with his brother *The Cyclo-pædia of American Literature*, 2 vols. (1855, enlarged and revised 1865, 75); prepared memorials of Francis L. Hawks (1867), Henry T. Tuckerman (1872), John Wolfe (1872), Samuel G. Drake (1876), and James W. Beeckman (1877); collected *Poems Relating to the American Revolution*, with



Durham Cathedral.



D-valve.



Durian (*Durio zibethinus*).



## D-VALVE—DWARF.

*Memoirs of their Authors* (1865); and wrote a *History of the War for the Union* (3 vols. 1861-65), *National Gallery of Eminent Americans* (2 vols. 1866), and *Biographies of Eminent Men and Women of Europe and America* (2 vols. 1873-4). For some time prior to his death he was associated with William Cullen Bryant, who died less than 2 months before him, in the preparation of an edition of Shakespeare. —His brother, GEORGE LONG D. (1823, Oct. 17—1863, Mar. 30), graduated at the Univ. of New York 1843, was admitted to the bar but like EVERT never practiced. Beside assisting his brother he began publishing a series of lives of English clergymen, and brought out those of *George Herbert* (1858), *Bishop Thomas Ken* (1859), *Jeremy Taylor* (1860), and *Hugh Latimer* (1861), and was engaged on that of *Bishop Leighton* at the time of his death. He was treas. of the Sunday School Union and Church Book Soc. of the Prot. Episc. Church for many years.

**D-VALVE**, n. [so called from its shape]: in *mach.*, a species of slide-valve, employed chiefly in the steam-engine, and adapted to bring each steam-port alternately in communication with the steam and exhaust respectively.

**DVOŘÁK**, *dvörsh-äk'*, ANTONIN: 1841, Sep. 8———; musical composer: b. Nelahozeves, Bohemia. The village school-master gave him lessons in violin-playing, of which D. made such profit that at the age of 16 he found employment as violinist in an orchestra at Prague; at the same time he attended the school of the organ there conducted by Pitzsch. On completing his studies under Pitzsch he won the second medal for proficiency, and found employment in the orchestra of the national theatre. The first public performance of a composition by D. was in 1873, when a hymn for male and female voices with orchestral accompaniment was rendered. The success was decisive, and thereafter D., giving up his situation in the theatre, devoted himself wholly to composition. His dances, songs, and symphonies have found favor with the best critics; and have won great popularity at home and abroad. He came to America 1892 under contract to be director for three years of the National Conservatory of Music, New York.

**DWALE**, n. *dwāl* [from *duil*: Sw. *dwala*, fainting, stupefaction: Dan. *dwale-drik*, a soporific, a dwale drink—from *dwale*, a trance, torpor]: the deadly night-shade—the *Atröpa belladon'na* (see BELLADONNA); in *her.*, a sable or black color.

**DWARF**, n. *dwawrf* [AS. *dweorg*; Icel. *dvergr*; Sw. *dwerf*, a dwarf: Skr. *dhvaras*, a female fairy]: any animal or plant much below the usual size; a man or woman much under the ordinary height; a page or attendant on a knight in olden times (see GIANTS AND DWARFS): V. to hinder from growing to the natural size. **DWARF'ING**, imp. making or keeping small. **DWARFED**, pp. *dwawrft*. **DWAR'-FISH**, a. *-fīsh*, like a dwarf; very small. **DWAR'FISHLY**, ad. *-lī*. **DWAR'FISHNESS**, n. **DWARF-BAY**, n. in *bot.*, *Daphne mezereum*; *Daphne Laureola*. **DWARF-CORNEL**, n. in *bot.*, a common modern bookname for *Cornus succica*. **DWARF-ELDER**, n. in *bot.*, *Sambucus ebulus*; *Ægopodium podagraria*. **DWARF-HONEYSUCKLE**, n. in *bot.*, *Cornus*



## DWARFED TREES—DWIGHT.

*suecica*. DWARF-MALE, n. in *bot.*, the antheridium of an algæ. DWARF-MALLOW, n. in *bot.*, *Malva rotundifolia*. DWARF-PALM, n. in *bot.*, a genuine palm, *Chamærops humilis*; *Opuntia vulgaris*. In this second case Dwarf-palm is an entire misnomer, the plant being a cactus, with no affinity or even analogy to the order *Palmaceæ*. DWARF-RAFTER, n. in *carp.*, little jack; a short rafter in the hip of a roof. See DEFORMITY.

DWARFED TREES, growing in flower-pots: characteristic ornament of Chinese and Japanese houses and gardens, and the production of them is an art which has been carried to great perfection. It depends upon the prevention of an abundant flow of sap, so that while the tree is kept living and healthful, vegetation does not go on with its natural activity. The trees are planted in shallow and narrow flower-pots; care is taken that their roots never pass into the ground beneath; are very sparingly supplied with water; their strongest and leading shoots are pinched off, and their branches are bent and twisted in various ways. A very extraordinary dwarfing is the result of these and other such processes; and the dwarfed trees not unfrequently abound in flowers and fruit.

DWARFED FRUIT TREES: see ORCHARD: ORCHARD HOUSE.

DWARKA, *dwâr'kâ*: maritime town, province of Guzerat, India, on the w. side of the peninsula of Kattywar; lat. 22° 15' n., and long. 69° 1' e. It is one of the most sacred places in this part of Hindustan. On an eminence over-hanging the sea-shore, which was once an islet, stands a great temple of Krishna, presenting to the mariner a conspicuous landmark; and connected therewith by a colonnade, is a smaller edifice dedicated to Deoki, the mother of Krishna. The Gumti, a bordering rivulet which barely reaches the ankle, is, notwithstanding its insignificance, an object of profound veneration. Pop. 5,000.

DWAY-BERRIES, n.: in *bot.*, *Atropa Belladonna*.

DWELL, v. *dwëll* [Dut. *dwaelen*, to go about, as opposed to going straight: AS. *dwelian*, to deceive: Icel. *dvelia*, to hinder: Dan. *dvale*, to dwell, to linger]: to live in a place; to inhabit; to reside; to abide for a time; to continue long; to linger on with affection. DWEL'LING, imp.: N. a place of residence; a habitation. DWELT, pt. and pp. *dwëlt*. DWEL'LER, n. one who. DWELLING-HOUSE, a settled residence. DWELLING-PLACE, a residence; a place of abode. To DWELL ON or UPON, to occupy a long time with; to continue on, as to dwell on a subject.—SYN. of 'dwell': to abide; sojourn; continue; rest; stay; live; remain.

DWIGHT, *dwît*, EDMUND: 1780, Nov. 28—1849, Apr. 1; b. Springfield, Mass.: merchant. He graduated at Yale College 1799; studied law, but became a merchant; and founded the mercantile firm 1815 which established the villages of Chicopee Falls (1822), Chicopee (1831), and Holyoke (1847). He was a member of the legislature many

## DWIGHT.

years, a founder of the American Antiquarian Soc. 1812, author of the present system of normal schools, to establish which he gave \$10,000, and a founder of the Mass. state board of education.

DWIGHT, HARRISON GRAY OTIS, D.D.: 1803, Nov. 22—1862, Jan. 25; b. Conway, Mass.: missionary. He graduated at Hamilton College, N. Y., 1825, and at Andover Theol. Seminary 1828, and was ordained and appointed a missionary of the A. B. C. F. M. 1829, July 15. After spending over a year in exploring Asia Minor, Persia, Armenia, and Georgia, he made Constantinople the base of his operations and founded the Armenian Mission there. He was remarkably successful as a missionary, wrote several books and tracts and translated a portion of the Bible into various oriental languages, published *Researches of Smith and Dwight in Armenia*, *Memoir of Mrs. Elizabeth B. Dwight*, *Christianity Revived in the East*, and *A Complete Catalogue of Literature in Armenia*. He lost his life in a railroad accident in Vt. while revisiting his native country. He received the degree D.D. from Hamilton College 1852.

DWIGHT, SERENO EDWARDS, D.D.: 1786, May 18—1850, Nov. 30; b. Greenfield Hill, Conn.: educator. He graduated at Yale College 1803, was tutor there 1806–10, practiced law in New Haven 1810–16, was licensed to preach 1816, chaplain in U. S. senate 1816–17, and pastor of the Park Street Cong'l Church, Boston, 1817–26. Returning to New Haven he engaged in literary work and teaching till 1833, when he was elected pres. of Hamilton College, but continued ill-health caused him to resign 1835. His published works comprise *Life of David Brainard* (1822), *Life and Works of Jonathan Edwards*. (10 vols. 1830), *The Hebrew Wife* (1836), and a memoir of his father, Pres. Timothy D., and sermons and addresses. He received the degree D.D. from Yale College 1835.

DWIGHT, THEODORE: 1764, Dec. 15—1846, July 12; b. Northampton, Mass.: journalist. He was a cousin of Judge Pierrepont Edwards and of Aaron Burr, and practiced law some time with eminent success. Removing to Hartford he edited *The Courant* and *The Connecticut Mirror* in the interest of the federalist party; was a member of congress 1806–7, of the state council 1809–15, and sec. of the Hartford convention 1814; and founded and edited *The New York Daily Advertiser* 1817–36. He was author of a *History of the Hartford Convention* (1833), and *Character of Thomas Jefferson, as exhibited in his own Writings* (1839).

DWIGHT, THEODORE WILLIAM, LL.D.: 1822, July 18—1892, June 29; b. Catskill, N. Y. He graduated at Hamilton College, N. Y., 1840; studied law at Yale College 1841–2; was tutor at Hamilton College 1842–46; and prof. of law, history, and political economy there, 1846–58; was elected prof. of municipal law in Columbia College, New York, 1858; and was soon afterward appointed warden of the newly-organized law school, which office he held till 1891. In 1867 he was a member of the N. Y. constitutional convention; 1868 became non-resident prof. of constitu-



## DWIGHT.

tional law in Cornell Univ.; 1869 lecturer on the same branch in Amherst College; 1873 vice-pres. N. Y. state board of public charities and judge of the special commission of appeals; 1874 pres. of the N. Y. State Prison Assoc. and member of the 'committee of seventy' citizens chosen to secure municipal reform; and 1886 counsel for the professors of Andover Theol. Seminary who were charged with heterodoxy. Prof. D. has been an assoc. editor of the *American Law Register* many years, edited Henry S. Maine's *Ancient Law* (1864), and published numerous legal treatises and arguments. He received the degree LL.D. from Rutgers's College, N. J., 1859, and Columbia College, 1860.

DWIGHT, *dwīt*, TIMOTHY, D.D., LL.D.: 1752, May 14—1817, Jan. 11; b. Northampton, Mass.: theologian, pres. of Yale College. He studied at Yale and was licensed as a Congl. preacher 1777. During the War of Independence, he was for some time chaplain in the American army. In 1783, he was ordained minister of the Congl. church, Greenfield, Conn., where he also conducted an academy for 12 years with distinguished success. In 1787 the College of Princeton, N. J., conferred on him the degree D.D.; and 1795, he was elected pres. of Yale College and prof. of divinity. D.'s principal work is his *Theology Explained and Defended in a Series of 173 Sermons* (5 vols. Middletown, Conn. 1818, etc.). It has been frequently reprinted in England; and has had great popularity in the U. S. and Great Britain. It is an excellent presentation of the moderate type of Calvinism which has prevailed in New England. D. was not a great original thinker; but his mind was fertile in apt and useful ideas, and was systematic in its working; his style was clear; he was impressive and eloquent as a preacher, and highly successful as an instructor. Among his writings were *The Conquest of Canaan, an Epic Poem* (1785); *Travels in New England and New York* (1821), reckoned by Southey the most important of his writings; and two vols. of *Sermons* (Edin. 1828).

DWIGHT, TIMOTHY, D.D., LL.D.: b. Norwich, Conn., 1828, Nov. 16; grandson of Pres. Timothy D. of Yale College (1752, May 14—1817, Jan. 11); he graduated at Yale College 1849, studied in its theol. school till 1853, was tutor in the college 1851–55, licensed as a Congl. preacher 1855, May 22, continued his studies in the universities of Bonn and Berlin 1856–58, and, returning to the United States in the latter year, was appointed Buckingham prof. of sacred literature and N. Test. Greek in Yale Theol. School. He was ordained a Congl. minister 1861, Sep. 15, was a member of the American committee for the revision of the Bible 1878–85, and succeeded Noah Porter, D.D., LL.D., as pres. of Yale University 1886. He has been a contributor to the *New Englander* magazine many years, and one of its editors, and published in it (1870–1) a notable series of articles on *The True Ideal of an American University*, which was subsequently republished and widely circulated. Pres. D. is a believer in a well-balanced application of the elective system, liberal in his ideas of a univ. course, popular



## DWINA—DYCE.

among the students, an engaging speaker, a profound scholar, and an incessant worker. Having ample private means, he gave his salary as prof. to the theol. school regularly for several years. He annotated the English translation of Meyer on *Romans* (1884), *Philippians*, *Philemon*, *Timothy*, *Hebrews*, and translated and annotated Godet on the *Gospel of John* (1886). He received the degree D.D. from the Chicago Theol. Seminary, 1869, and LL.D. from Harvard Univ. 1886.

DWINA, *dwē'na* or *dwī'na*, NORTHERN—as distinguished from the Western Dwina or Dūna (q.v.): important river of Russia. It has its origin in the confluence of the Suchona and the Jug, two streams, the latter more than 200 m., and the former nearly 300 m. in length, rising in the south of the province of Vologda, and uniting in lat. 60° 45' n., long. 46° 30' e. The D., from the union of these streams, flows n. about 50 m., and receives the Vytchegda from the e., a river 500 m. long. At this point, the D. becomes navigable, and here it alters its direction, and proceeds n.w. toward the Gulf of Archangel, into which it flows, having been joined on the right by the Pinega, and on the left by the Waga, and having traversed a course of about 700 m. Its basin comprises 123,900 sq. m. Its average width is from 500 to 600 ft.; before debouching into the White Sea, however, its surface, there marked by many islands, increases in width to about four miles. The waters of the the D., the largest river that falls into the White Sea, abound with fish. Large vessels cannot enter the D., on account of the shoals at its mouth.

DWINDLE, v. *dwīn'dl* [AS. *dwinan*; Low Ger. *dwanen*, to fade. to vanish: Icel. *dvina*, to diminish]: to become less; to lose bulk; to shrink; to consume or waste away; to degenerate. DWIN'DLING, imp. DWINDLED, pp. *dwīn'dld*. DWINE, v. *dwīn* [DWINDLE may be a dim. of DWINE]: in *prov. Eng.*, to waste away; to pine. DWI'NING, imp. DWINED, pp. *dwīnd*.

DYAD, n. *dī'ād* [Gr. *dyūs*, two]: in *chem.*, a bi-equivalent; an element of two equivalents; a molecule which can combine with two monad atoms. DYADIC ARITHMETIC, n. a system of notation in which only two figures, 1 and 0 are used; thus 2 is represented by 10, 3 by 11, 4 by 100, 9 by 1001.

DYAKS, n. plu. *dī'āks*, or DAJAKS, n. plu. *dā'yāks*: a people of Borneo, a large island of the East Indian archipelago: see BORNEO.

DYAUS, n. *dī'ūs* [Skr.]: a divinity of the Vedas, the god of the sky, and hence of rain. The name is the same as the Greek Zeus, and Latin Jupiter.

DYCE, *dīs*, ALEXANDER: 1798, June 30–1869; b. Edinburgh: English literary historian. He was educated at the High School of Edinburgh, and at Oxford. After officiating for some time as curate, he settled in London 1827. His literary reputation is based chiefly on his editions of the older English poets and authors—George Peele, Robert

## DYCE—DYCK.

Greene, John Webster, Shirley, Thomas Middleton, John Skelton (an author in the beginning of the 16th c., previously little known), Beaumont and Fletcher, Ford, and Marlowe, with biographies of the authors, and instructive notices. He also edited the poems of Shakespeare, Pope, Akenside, and Beattie, for Pickering's Aldine Edition of the Poets. An old play discovered by him, called *Timon*, and which may possibly have first suggested to the great poet the idea of his drama of the same name, was published for the Shakespeare Soc., also another entitled *Sir Thomas More*. In conjunction with Collier, Halliwell, and Wright, D. founded the Percy Soc. for the publication of old English ballads, plays, and poems. His ability as a commentator on Shakespeare is proved by his *Complete Edition of the Works of Shakespeare; the Text revised; with Account of the Life, Plays, and Editions of Shakespeare, Notes, etc.* (1858.)

DYCE, WILLIAM, R.A.: 1806-64; b. Aberdeen, Scotland: painter. He was educated at the Univ. of Aberdeen, and at the age of 16 took the degree master of arts. After acquiring the rudiments of his art-education he went to Rome, where he studied for some years. His tendency at first was very strongly, and continued so under certain modifications, toward early Italian, or pre-Raphaelite art, and his productions attracted the marked attention of Overbeck, head of the modern German school. Returning from Rome, he settled in Edinburgh, where, besides painting portraits, he contributed largely to the exhibitions. The first picture that he exhibited in Edinburgh was in the Perugino style, and though evincing great power, was at that period, 1829, but little appreciated; his *Puck*, however, exhibited at the same time, was very successful, and most of his after-contributions to the exhibitions of the Royal Scottish Acad., of which he was a member, were deservedly popular, particularly his picture of *Francesca da Rimini*, 1837. After this he went to London, to be head-master of the New School of Design at Somerset House, an office which he held for three years. Soon after this he was appointed prof. of painting in the London University. He distinguished himself at the Westminster competition by his frescoes, and in consequence was one of the artists selected to decorate the Palace of Westminster and the House of Lords; and at Osborne House several works in fresco were executed by him. D. was elected an assoc. of the Royal Acad. 1844, and academician 1848. The following are some his works exhibited in the Royal Acad.: *King Joash Shooting the Arrow of Deliverance*, *Madonna and Child* (1846), *Meeting of Jacob and Rachel* (1850), *Christabel* (1855), *The Good Shepherd* (1856), *Titian Preparing to make his Essay in Coloring*, *Neptune Assigning to Britannia the Empire of the Sea*, a study for a fresco at Osborne (1857), *St. John Leading Home his Adopted Mother*, *The Man of Sorrows* (1860), and *George Herbert at Bemerton* (1861).

DYCK, Sir ANTHONY VAN: see VANDYCK.



## DYE—DYEING.

**DYE**, v. *dī* [AS. *deag*, a dye, a color: Dan. *dygge*, to sprinkle with water Gael. *dath*, a hue, a color]: to color, to stain; to tinge deeply; to give a new color to: N. coloring matter; color; stain. **DYEING**, imp. *dī'ing*: N. the art or trade of fixing colors in various fabrics. **DYED**, pp. *did*. **DY'ER**, n. one who dyes. **DYESTER**, n. a dyer. **DYE-HOUSE**, the building in which the operation of dyeing is carried on. **DYER'S-MOSS**, n. in *bot.*, *Roccella tinctoria*; also called Archil, Orchil, and Cudbear. **DYER'S-SPIRIT**, n. nitro-muriatic of tin, employed as a mordant.

**DYEING**: art of staining or coloring yarn or cloth. It has been practiced among eastern nations from time immemorial; and in the sacred writings, we read of the vestments of the high-priest being dyed purple, of linen cloths being dyed blue, purple, and scarlet, and of rams' skins being dyed red. The famous Tyrian purple is believed to have been discovered by an inhabitant of Tyre abt. B.C. 1500; and immediately afterward the Tyrian purple became the badge of royalty, and cloth dyed with it commanded a princely price. The Egyptians, Greeks, and Romans practiced the art of D.; and gradually it became more and more wide-spread as civilization advanced, the discovery of America and other lands materially increasing the number of dye-stuffs. In earlier times, D. was much more extensively followed as a domestic art than it now is. In the Highlands of Scotland, however, women are still in the habit of dyeing cloth *brown* by immersing it in a solution of copperas (sulphate of iron), and then treating it with a decoction of sumach, logwood, and crottel (*Parmelia omphalodes*), a lichen which covers many rocks and trees in moist situations; *black*, by immersing the cloth or yarn in an infusion of the bark of the alder-tree (*Alnus glutinosa*), with copperas and a little sumach; *yellow*, by the common heather (*Calluna vulgaris*) and alum; *red*, by the roots of bed-straw (*Galium verum*) and alum, etc.

The dye-stuffs (q.v.) employed in the various processes are numerous, and when two or more are associated together, many different shades and colors are produced besides the original color yielded by each. The D. materials are procured from the mineral, vegetable, and animal kingdoms, and are often very costly. The arrangements connected with D. operations are at times simple, while at other times they are complex, and require the greatest care and skill on the part of the dyer. In communicating the deep indigo blue to woollen cloth and yarn, a vat is taken, about 6 or 7 ft. in diameter, and 8 to 9 ft. in depth, and nearly filled with water, with 18–22 lbs. of indigo, 10–20 lbs. of madder, 7–9 lbs. of bran, and generally 7–9 lbs. of woad. After the requisite boiling, and the addition of 7 or 8 lbs. of lime, to form an alkaline liquid in which the indigo can be held in solution, the whole is well closed over with tightly fitting wooden covers; and in a day, the putrid fermentation of the woad and bran proceeds, the result of which is to abstract the oxygen from the blue indigo, the color of which is gradually reduced till it assumes a yellowish color, and the solution then contains



## DYEING.

indigo white. If woolen yarn or cloth is now dipped in this liquid, it comes out with a yellow tint, from the attachment of the white indigo solution; but when exposed to the air, the oxygen immediately begins to act upon the white indigo, combining with it, so as to form oxidized or blue indigo, and as the process of oxidation proceeds, the yarn or cloth becomes first of a greenish and then of a blue color. If the cloth be again soaked in the yellowish solution, and subsequently exposed to the air, the depth of the blue color may be increased step by step, till it arrives at that deep shade of blue well known, especially in the coarser qualities of woolen cloth. In the dyeing of cotton with indigo, the vat is prepared differently. The indigo is first ground into a thin paste with water, and afterward placed in a vat with protosulphate of iron and milk of lime. The lime ( $\text{CaO}$ ) takes the sulphuric oxide,  $\text{SO}_3$ , from the sulphate of iron  $\text{FeSO}_4$ , forming calcium sulphate  $\text{CaSO}_4$ , and liberating protoxide of iron,  $\text{FeO}$ , which immediately abstracts the oxygen from the blue indigo, reducing it to white indigo, and the latter dissolves in the excess of lime present in the vat, yielding a colorless solution. When cotton cloth or yarn is dipped in this, it comes out of the vat almost colorless; but on exposure to the air, the indigo becomes reoxidized, and the cloth passes to a green, and ultimately to a deep-blue shade. The cloth or yarn is then washed in water, and afterward soaked in very dilute sulphuric acid, to remove any oxide of iron remaining attached, and rewashed in water, when the blue color becomes more bright and clear.

In the fixation of color upon cloth, recourse is often had to a mordant (see CALICO), which acts as a middle agent, and attaches the color to the cloth. The principal mordants are alum, cream of tartar, and salts of tin. Previous to the application of any color, the cloth or yarn must be well cleansed from grease, oil, etc., by scouring in soda or in soap, and except where the material is to be dyed of a dark color, the goods are also subjected to the process of bleaching. In the case of fabrics which require a smooth surface, the preliminary operation of singeing off the loose hairs is resorted to: see CALICO.

**DYEING OF COTTON.**—The following recipes for the dyeing of cotton apply to 10 lbs. weight of cotton yarn or cloth, which is found to be the smallest quantity capable of being well dyed at one time. The proportions of each ingredient may be altered, however, to correspond with the quantity of cloth or yarn to be operated upon.

1. *Common Black.*—Take 3 lbs. sumach, and treat with hot water; steep the goods in the hot decoction for some hours; wring out; wash for 10 minutes in lime-water, and for 30 minutes in a solution of 2 lbs. copperas. Wash the goods well in cold water, sometimes repeating the treatment with lime, and rewashing; then work the goods for 30 minutes in a warm solution of 3 lbs. of logwood, and afterward with 2 oz. copperas; work again for 10 minutes; wash, and dry.

2. *Jet Black.*—Proceed as at 1, adding 1 lb. of fustic with

## DYEING.

the logwood; and when 3 pints of iron liquor are used instead of the 2 oz. copperas, a more brilliant black is obtained.

3. *Blue Black*.—Use the indigo blue vat, and then proceed as at 1.

4. *Brown*.—Treat the goods with a yellow dye; then work for 30 minutes in a decoction of 2 lbs. lima wood and 8 oz. logwood; lift and work with 2 oz. alum for 15 minutes; then wash, and dry.

5. *Catechu Brown*.—Immerse the goods at a boiling temperature in a decoction of catechu; then work for 30 minutes in a hot solution of 6 oz. bichromate of potash. Wash in hot water, and if the latter contain a little soap, the color will be improved.

6. *Chocolate or French Brown*.—Dye the goods with a spirit yellow; then treat for half an hour with a solution of 3 lbs. of logwood; raise with a little red liquor; work for 10 minutes; wash, and dry.

7. *Red*.—Make a hot solution of 3 lbs. of sumach; introduce the goods, and let stand till the liquor is cold; then wring out, and work in water containing in each gallon a gill of red spirits (prepared by adding 2 oz. of feathered tin by degrees to a mixture of three parts of hydrochloric acid, one part of nitric acid, and one of water in the cold) for 30 minutes; wring and wash well; then work the goods for 30 minutes in a lukewarm decoction of 3 lbs. of lima wood, and 1 lb. of fustic; add a gill of red spirits; work the goods longer; wash, and dry. The famous Turkey-red is imparted to the cloth by first impregnating it with an oily or fatty substance, and then subjecting it to a decoction of madder. It is one of the most durable of all colors.

8. *Yellow or Straw*.—Work the goods in a weak solution of acetate of lead; then wring out, and work in a dilute solution of bichromate of potash; wring out, and work again in the lead solution; wash, and dry.

9. *Leghorn Yellow*.—Proceed as at 8, but add a little arnotto liquor with the solution of bichromate of potash.

10. *Spirit Yellow*.—Work the goods through a weak solution of protochloride of tin for 30 minutes; then work in a solution of quercitron bark for 15 minutes; lift out, and work again in tin solution, and wash in cold water.

11. *Orange*.—Proceed as at 8, and afterward pass through lime-water at the boiling-point, ultimately washing in cold water.

12. *Blue*.—The goods are worked in various strengths of solutions of salts of iron, such as nitrate of iron; wring out; wash in water, and then work in solution of yellow prussiate of potash; wring out, and wash in water containing a little alum. The various shades of blue may be obtained by using stronger or weaker solutions.

13. *Green*.—Dye the cloth blue; then work in red liquor (acetate of alumina); wash in water; work in decoction of fustic or bark; raise with solution of alum; wash in cold water, and dry. The darker shades of green, as olive or bottle green, are brought out by the use of sumach and logwood with the fustic.



14. *Puce or Lilac*.—Work the cloth or yarn in red spirits (see 7), then in logwood solution at a temperature of 140° F., adding a little red spirits, red liquor, or alum; wash, and dry; or dye the cloth blue (12); then work in solution of logwood; add alum; work again; wash, and dry.

15. *Purple*.—Soak the goods in a warm decoction of sumach till cold; work for an hour in red spirits; wash; work in hot solution of logwood; then add a little red spirits, and work again; wash, and dry. The various shades of purple may be obtained by altering the strength of the chemicals; the more sumach, the browner the hue, and the more logwood, the bluer the purple becomes.

16. *Lavender or Peach*.—Work the goods for 20 minutes in spirit-plumb (a strong solution of logwood, treated with about one-sixth of its volume of a solution of tin, made by dissolving tin in six or seven parts of hydrochloric acid, one part of nitric acid, and one of water); wring out, and wash well in cold water.

17. *Safflower Lavender* is obtained by dyeing the goods a light-blue, then working in decoction of safflower, which places a pink on the top of the blue.

18. *Drab*.—Work the goods in a decoction of sumach; lift, add copperas; rework; wash in water; then work in a mixed decoction of fustic, lima wood, and logwood; raise with a little alum; wash, and dry. Catechu is occasionally employed.

**DYEING OF WOOL.**—In the dyeing of woolen yarn and cloth, the various steeps are used warm, but the washings in water are done cold. Care must be taken to remove every particle of grease from the wool by washing with soda and soap, before it is subjected to the process of dyeing, else the coloring matters will not adhere. The more common and important colors are obtained as follows:

19. *Black*—by working the cloth in a bath of camwood, then of copperas; after which wash out; then treat with decoction of logwood and copperas: or work in a bath of bichromate of potash, alum, and fustic; lift, and expose to the air; then immerse in decoction of logwood, barwood, and fustic; thereafter of copperas.

20. *Brown*.—The goods are worked in a bath of fustic, madder, peachwood, and logwood; then introduce into dilute solution of copperas: or the goods are treated with a bath of bichromate of potash, argol, and alum, washed, and then introduced into a bath of fustic, madder, peachwood, and logwood.

21. *Red*—by working in a decoction of bichromate of potash and alum, and subsequently in a bath of peach or lima wood, with a little alum. Scarlet is obtained from cream of tartar, cochineal, sumach, and fustic.

22. *Crimson*—from cochineal, cream of tartar, and chloride of tin. Cudbear gives a wine tint.

23. *Pink*.—Work the goods in a bath of tartar, alum, cochineal, and red spirits.

24. *Orange*—from a bath of sumach, cochineal, fustic, tartar, and red spirits.

## DYEING.

25. *Yellow*—from a bath of tartar and alum; then a decoction of bark, sumach, fustic, and red spirits.

26. *Blue*.—Various shades may be obtained from immersion in salts of iron, and then in solutions of yellow prussiate of potash (see 12). Also work the wool in a bath of argol, alum, and indigo extract.

27. *Green*.—Work the goods in a bath of fustic, argol, and alum, and thereafter in a solution of indigo. The dark shades of green, such as olive, are brought out by a bath of fustic, logwood, madder, and peachwood, and afterward of copperas.

28. *Violet*—from cudbear, logwood, barwood, or camwood, and peachwood; as also alum. The addition of copperas brings out a puce tint.

29. *Drab*.—The manifold shades of this color are procured from variable strengths of decoctions of madder, peachwood, logwood, fustic, associated with alum and copperas.

DYEING OF SILK.—The operations connected with the dyeing of silk are similar to those already sketched, but a more thorough scouring of the raw material requires to be made, so as to remove all the gum and wax belonging naturally to the fibre.

30. *Black* is obtained by working the silken material in copperas (sulphate of iron), then in logwood containing some chamber liquid, and repeating the treatment with copperas and logwood till the requisite shade is procured. A little nitrate of iron tends to give a more full, deep black; and alum and white soap are also used with advantage. Acetate of copper is occasionally used.

31. *Blue Black*.—Dye a blue as at 12, and then proceed as at 30.

32. *Brown*.—Obtain an orange by immersion in a solution of annotta, then treat with copperas; and introduce into a bath of fustic, logwood, archil, and a little alum. If a more yellow tint is required, add more fustic; redness is obtained by adding peachwood, and blueness by the addition of logwood.

33. *Reds* are obtained from peachwood and fustic, and thereafter red spirits. Annotta is used in producing the scarlet shades, and cochineal and safflower in the more expensive red dyes. Rubies and maroons require cudbear.

34. *Pink*—from safflower, associated with sulphuric acid and cream of tartar.

35. *Orange and Yellow*—by treating the goods with more or less strong solutions of annotta, associated with alum and white soap.

36. *Blue*—from salts of iron and yellow prussiate of potash, or from solutions of sulphate of indigo, assisted with a little alum.

37. *Green*—from steeping in decoctions of fustic and sulphate of indigo, with a little alum. The darker shades have copperas added and logwood.

38. *French and Pearl White*.—Work the silk in a lather of white soap, to which archil or cudbear has been added, to give the required shade.

39. *Drab*—from decoctions of sumach, fustic, logwood,



## DYER.

are more or less copperas, according to the depth of shade required.

**DYEING OF MIXED FABRICS.**—The coloration of textile fabrics composed of more than one kind of material, generally requires two or more processes, as the plan pursued in dyeing wool is seldom capable of fixing the color upon cotton. The customary plan followed is to immerse the fabric in the requisite baths, to dye the wool, and then to treat the partially dyed material in the manner found suitable for cotton. Occasionally, the woollen thread of the cloth is dyed of one color, and thereafter the cotton is treated so as to acquire a different shade or color. For producing a colored pattern on cloth, see **CALICO**. See **DYE-STUFFS**.

**DYER, dî'ér**, ALEXANDER BRYDIE, U.S.A.: 1815, Jan. 10—1874, May 20; b. Richmond, Va.: U. S. ordnance officer. He graduated at the U. S. Milit. Acad. 1837, served in the artil. branch of the army at Fortress Monroe and in the Seminole campaign in Fla., was transferred to the ordnance branch and on duty at various arsenals 1838-46; chief of ordnance of army invading Mexico 1846-48; brevetted 1st lieut. and capt. for gallant services in the Mexican war; and on ordnance and arsenal duty 1848-61. During 1859-63 he was a member of the ordinance board, and 1861-64 was in command of the armory at Springfield, Mass. He became chief of ordnance, U.S.A., with the rank of brig. gen., and was placed in charge of the ordnance bureau at Washington, 1864, and received the brevet of maj. gen. 1865 for distinguished services during the civil war.

**DYER, dî'ér**, GEORGE: 1755, Mar. 15-1841; b. London: antiquary and scholar. He was educated first at Christ's Hospital, afterward at Emanuel College, Cambridge, which he entered 1774, and where, after four years' study, he took his degree B.A. During the next 14 years, he was variously engaged, chiefly at Cambridge, as usher, tutor, and as minister (of a Bapt. church), but he finally settled in London 1792. Here he applied himself to literature, and produced, among many works of less note, *History of the University and Colleges of Cambridge* (Lond. 2 vols. 1814), and *Privileges of the University of Cambridge* (Lond. 2 vols. 1824). He also contributed largely to magazines. He died in London. His remarkable honesty of character appears in his works.

**DY'ER**, JOHN: 1700-58; b. Aberglasney, in Caermarthen-shire, Wales: clergyman of the Church of England, and poet. He was educated at Westminster School, and was intended for the law, but abandoned that study for painting. In 1727, he published his poem, *Grongar Hill*, remarkable for simplicity, warmth of feeling, and exquisite descriptions of nature. He then made the tour of Italy, and returning in bad health, took orders, and obtained some ecclesiastical preferment. In his didactic poem, *The Fleece* (1754), the difficult subject is treated with great success; but the unpretending tone of the poem made no impression upon his contemporaries. Another poem, *The Ruins of Rome* (1740), abounds in isolated beauties. A collected edition of his poems appeared 1761.

## DYE-STUFFS.

**DYE-STUFFS:** substances used in dyeing (q.v.); derived from the animal, mineral, and vegetable kingdoms, the greatest number from the last mentioned. To the animal kingdom, and to the class of insects, we are indebted for *Cochineal*—consequently for *Carmin*—*Kermes*, and *Lac*, and less directly for *Galls*. The *Tyrian purple* of the ancients also is said to have been a product of the animal kingdom, obtained from a mollusk.—The dye-stuffs obtained from the vegetable kingdom are numerous, and in every part of the world there are some in domestic use, which have not become articles of commerce. For such dye-stuffs in use in the Highlands of Scotland, see **DYEING**. Dye-stuffs are procured from plants of widely different natural families; there are some indeed in which certain coloring matters appear extensively prevalent, as in *Rubiaceæ* (madder, etc.), and the genus *Cesalpinia* (q.v.). They are obtained from almost all different parts of plants, as the heart-wood (*duramen*) of the stem (Logwood, Brazil-wood, Camwood, Fustic, etc.); the bark (Alder, etc.), the root or its bark (Barberry root, etc.); the leaves and other herbaceous parts (Indigo, etc.); the corolla (Safflower); the fruit (French Berries, Arnotto, etc.). The principal dye-stuffs are the following: *Alkanet* (q.v.), useful in dyeing various shades of lilac, lavender, and violet, which are, however, liable to fade on exposure to light. *Aloes*, obtained by evaporating the juice of the aloe, which is grown in the E. and W. Indies, Sicily, Italy, and Malta. It contains a brown coloring matter named *Aloetin*, which may be employed in the production of a brown tint. *Arnotto* (q.v.), employed in imparting the various shades of yellow, orange, and scarlet, to silk, wool, and cotton. *Archil*, yielding, when infused in water, a crimson dye of great beauty, though fugitive, and used in giving a finish to wool and silk previously dyed. *Barberry root*, imported from the E. Indies, and containing a yellow coloring matter called *berberin*. *Brazil-wood*, often called *peach-wood*, containing *brazilin*, which, in contact with the air, yields a rich red color. *Camwood* (q.v.) or *Barwood*, has a red color similar to that of Brazil-wood, is used generally in the form of a coarse powder, and readily imparts its color to water. *Catechu*, yields a reddish-brown solution in water, and performs an important office in the dyeing of many shades of brown, black, and green. *Chica* (q.v.), employed in the dyeing of wool and cotton of an orange-yellow color. *Cochineal*, employed directly, or indirectly in the form of carmine (extracted from the cochineal), in imparting the most beautiful red and crimson colors. *French, Persian, Turkey, or Spanish berries*, obtained from several species of *Rhamnus* (see **BUCKTHORN**), yield a powerful yellow dye. *Fustet*, the finely divided wood of *Rhus cotinus* (see **SUMACH**), a yellow dye. *Fustic* or *yellow wood*, used for dyeing cloth yellow, and for communicating a good green tint to cloth already rendered blue; also, in conjunction with other dyes, in imparting various shades of drabs, olives, fawns, etc. *Galls* or *gall-nuts* are employed in dyeing cloth of a dark or black color. *Indigo* (q.v.), extensively used in the



## DYE-STUFFS.

dyeing of yarn and cloth of a deep blue color, which may be afterward rendered green by a yellow dye. *Kermes*, *Kermes grains*, or *Alkermes*, an excellent material for dyeing many shades of red, and one of the most ancient dye-stuffs employed in the coloring of silk. *Lac* (q.v.), *Shell-lac*, or *Stick-lac*, is used in the preparation of red dyes. *Logwood* (q.v.), broken up into small chips, or reduced to powder, is employed in the dyeing of reds, and, when associated with other substances, yields purples, violets, and blues. *Madder* (q.v.), one of the most important of dye-stuffs, is extensively used in the dyeing of cloth and yarn red, purple, brown, etc. *Munjeet* or *Indian madder* is used in India instead of madder. *Quercitron* yields a rich orange-yellow, or yellow-red dye, capable of being afterward made a brown; and when used after a blue dye, it changes the latter to a bright green. *Safflower* yields a rich yellow dye. *Sandal-wood*, *Santal* or *Saunders wood*, yields a red color, which, with other substances, may be altered to violet, reddish brown, and scarlet. *Sumach*, occasionally called *young fustic*, is employed as a yellow dye, and also for the tannin and gallic acid it contains, which enables decoctions of sumach to be used with great effect for imparting depth or solidity to other colors. *Turmeric*, or *Indian Saffron*, is employed as a yellow dye, but is very fugitive. *Weld*, or *Wold*, produces a rich but fugitive yellow. *Woad* is used as a blue dye for woollen and silk yarn and cloth, either with or without indigo. *Wongshy* is a new yellow dye-stuff procured from the seed-vessels of a plant belonging to the family of *Gentianaceæ*, and imported from Batavia.

The above list of dye-stuffs comprehends those obtained, directly or indirectly, from the vegetable and animal kingdoms; for longer account of the substances see the respective titles. For other dye-stuffs less generally used, see the titles of different orders and genera of plants. For the metallic salts and compounds used in dyeing, see the various metals; thus for acetate of lead, see LEAD; sulphate of iron, see IRON; etc.

**COAL-TAR COLORS.**—The most recent discovery important in dyeing, is the extraction of colored substances of great beauty from coal-tar, and the application of these to the coloring of cloth. At the present time, these dyes of coal-tar origin are most extensively employed, and give rise to the fashionable colors named Aniline purple, Tyrian purple or Mauve, Violine, Roseine, Fuchsine or Magenta, Solferina, Bleu de Paris, Aniline green or Emeraldine, Azuline, etc. It is only, however, within the last 30 years that these dyes have become practically known, though the preliminary discoveries in connection with their extraction were made in 1826. The condensable product or gas-liquor obtained during the destructive distillation of coal in gas-works, consists of aqueous matter holding salts of ammonia in solution, and tar with naphtha. The tar consists of a numerous class of bodies, of which aniline and benzole are two. The aniline is present in minute quantity; and for manufacturing purposes, means are generally

resorted to for the conversion of the benzole of gas-tar into aniline. The process followed on the commercial scale acts upon the benzole by nitric acid, by which it is converted into nitro-benzole, and thereafter, by the action of acetate of the protoxide of iron, it becomes aniline.

*Aniline Purple*.—In the preparation of the dye known as aniline purple, solutions of equal equivalents of sulphate of aniline and bichromate of potash are mixed together; and when the reaction is complete, a black precipitate is obtained, which is dried, and then digested several times in coal-tar naphtha, to separate all resinous matter. The residue is dissolved by successive quantities of alcohol; and the solution being placed in a retort, the alcohol is distilled off, and the aniline purple is left as a beautiful bronze-colored substance. Aniline purple is slightly soluble in cold water, more so in hot water, and is readily dissolved by the alcohols and aniline itself. It is nearly insoluble in ether and naphtha.

*Roseine* is most readily prepared on the commercial scale by adding two equivalents of binocide of lead to a boiling solution of one equivalent of sulphate of aniline, and boiling the whole for a short time. On filtration, a rose-colored solution is obtained, which is evaporated down to small bulk, when some resin separates, and the roseine is precipitated by soda or potash, and being collected on a filter, can be washed and dried. This dye is readily soluble in alcohol, and yields a very intense crimson color, which, on being evaporated to dryness, leaves a dark metallic-looking and brittle residue of roseine. It is soluble in water, but not in naphtha.

*Violine* is procured by the oxidation of aniline, and the process generally followed is to heat a mixture of two equivalents of sulphuric acid, one equivalent of aniline, and some water, to the boiling-point, then add binocide of lead, boil for some time, and filter hot. A purple liquid is obtained, which is boiled with potash till the aniline present is volatilized, and the coloring matter is precipitated, when the latter is thrown on a filter, washed with water, and dissolved in a dilute solution of tartaric acid. On filtration, the colored liquid is evaporated to small bulk, refiltered, reprecipitated by potash and soda, and the precipitate being dissolved in alcohol, yields an alcoholic colored solution, which on distilling off the alcohol, leaves the violine as a brittle bronze-colored substance. Violine is very slightly soluble in water, is readily dissolved by alcohol, and is insoluble in ether and naphtha.

*Fuchsine* or *Magenta* is prepared by adding anhydrous bichloride of tin by degrees to aniline. The materials are constantly stirred during the operation, to keep down the intensity of the action, and the result is, that much heat is evolved, the mixture becomes pasty, then liquid and brown; and as the temperature approaches the boiling-point, it becomes a dark, almost black liquid, which in very thin layers presents a rich crimson color. This liquid is boiled for some time, much water added, the whole reboiled, so as to volatilize any free aniline, and chloride of sodium



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(common salt) added till saturation, when the fuchsine or magenta is precipitated as a golden-green, semi-solid, pitchy substance. Any resinous matter still remaining may be separated by digestion in benzole. This dye may be obtained also by acting upon aniline with nitrate of mercury. Fuchsine or magenta is sparingly soluble in water, dissolves to some extent in alcohol, and is insoluble in ether and naphtha.

*Bleu de Paris* is prepared by heating 9 parts by weight of bichloride of tin and 16 parts of aniline to a temperature of about 350° F., in a sealed tube, for 30 hours, when a blue product is obtained, which is soluble in alcohol, and crystallizes therefrom in fine needles of a lively blue color. *Bleu de Paris* is soluble in water, alcohol, wood-spirit, and acetic acid, and insoluble in ether and bisulphuret of carbon.

*Aniline Green* or *Emeraldine* is obtained by acting upon a hydrochloric acid solution of aniline by chlorate of potash, when the aniline becomes oxidized, and yields a dull green precipitate, which on drying becomes an olive-green residue. It is insoluble in water, alcohol, ether, and benzole, and in the presence of a free acid the green color improves in appearance, though it returns to its original shade when the free acid is removed.

*Quinoline* or *Chinoline* is present in coal-tar, and may be employed to yield three coloring matters—a violet, a blue, and a green; but the processes as yet followed in their preparation belong more to the laboratory experiments of the scientific chemist than to the operations of the manufacturer.

*Picric Acid* is obtained by acting upon many organic substances, such as indigo, aniline, carbolic acid, salicin, silk, aloes, gum-resins, etc., by nitric acid. On the commercial scale, carbolic acid is generally employed, and it is first treated with nitric acid of slightly less density than 1,300 (water = 1,000), and afterward boiled with stronger acid, when it passes into picric acid, and is precipitated on dilution with water. It can be purified by recrystallization from boiling water. Pure picric acid crystallizes in lamina of a primrose yellow color.

*Azuline* is the only other coloring matter of practical importance derived directly or indirectly from coal-tar. It is a brittle, non-crystallizable substance, with a copper-colored metallic appearance. It is sparingly soluble in water, but is soluble in alcohol, yielding a fine blue solution with a shade of red. Treated with concentrated sulphuric acid, it becomes a fine blood-red liquid, which, on dilution with much water, gives a red precipitate of azuline.

*Pittacal* is a blue coloring matter obtained from coal-tar.

*Dyeing of Silk and Wool by the Coal-tar Colors.*—This department of the operations of the dyer is very simple, as the silk and wool fibres possess the power of taking up and fixing the majority of these coloring matters with great rapidity, whenever the yarn or textile fabric is placed in the vessel containing a solution of the color. In the dyeing of silk with aniline purple, violine, and roseine, the alco-

## DYING—DYING DECLARATION.

boilic solution of the color is diluted with eight times its volume of hot water acidulated with tartaric acid, and thereafter treated with a larger quantity of cold water. The silk is merely worked in this comparatively weak solution of the dye till the shade of color is deep enough. The addition of a little sulphate of indigo to the dye-vat assists in bringing out a more decided blue tint. The same result is obtained by first dyeing the goods with Prussian blue before immersion in the coal-tar color. When silk is to be dyed with fuchsine, picric acid, chinoline blue or chinoline violet, the goods require only to be worked in water-solutions of these colors. A little acetic acid added to the vat containing the fuchsine or picric acid is advantageous, and if a solution of sulphate of indigo is mixed with the solution of picric acid, the goods acquire a fine green color.

Azuline is attached to silk with more difficulty than any of the preceding colors. The silk requires to be worked first in a solution of azuline acidulated with sulphuric acid, and thereafter the liquid is raised to the boiling-point, and the silk continued to be worked in it. The goods are then washed in water, worked in a bath of soap-lather, rinsed, and finished in a weak acid bath.

Wool is died with aniline purple, violine, roseine, fuchsine, and chinoline by merely working the yarn or cloth in a vat containing a water-solution of the coloring matter at a temperature ranging between 112° and 140° F.

Cotton has not the power of firmly attaching, directly, coal-tar colors to its fibre so as to resist the action of soda and of soap. When the cotton, however, is treated with a solution containing much tannin, such as a decoction of sumach, or galls, for an hour or so, then introduced into a dilute solution of alum or stannate of soda, and lastly, passed into a dilute acid liquid, and washed in water, it acquires a great power of firmly attaching aniline purple, roseine, violine, fuchsine, and chinoline colors, whenever it is worked in a dye-vat containing these coloring matters. This principle of the attachment of these colors to cotton by means of a mordant of tannin and alum, may be applied in printing patterns upon cloth, as in calico-printing (q.v.). The pattern is printed on the cloth by means of tannin and alum dissolved in water and thickened with gum; and afterward, when the prepared goods have been introduced into a hot dilute acid solution of the coloring matter, the dye becomes attached to those parts on which only the tannin has been printed, and leaves the other parts uncolored. Another mode is to mix the dye with albumen or lacterine, print on the cloth, and then subject to the action of steam, which coagulates the albumen or lacterine, and at the same time fixes the color on the cloth.

**DYING**, a. *dī'ing* [from **DIE**, which see]: perishing; losing life; wasting away; mortal; given or uttered just before death; pertaining to death. **DY'INGLY**, ad. *-lī*.

**DY'ING DECLARATION**: declaration by a person in the immediate prospect of death, relative to the mode of his death. By the law of all nations it is received as evi-



dence. The ground of this exception to the general rule of law, that hearsay evidence is inadmissible, is thus clearly stated by Lord Chief Baron Eyre: 'That they are declarations made in extremity, when the party is at the point of death, and when every hope of this world is gone; when every motive to falsehood is silenced, and the mind is induced, by the most powerful considerations, to speak the truth: a situation so solemn and so awful is considered by the law as creating an obligation equal to that which is imposed by a positive oath in a court of justice.' In Scotland, the dying declaration of a witness is admissible even though he is not himself conscious of the danger of death. In this respect, the law of Scotland differs from that of England and America. The general rules as to dying declarations are, that they cannot be received in any civil case, and in criminal cases only where the death of the deceased is the subject of the charge, and the circumstances of the death are the subject of the dying declaration. They must be made, except in Scotland, with the full knowledge of impending death; they are subject to the ordinary rules of law as to capacity to give evidence; they must relate to facts only, and not opinions, and must be freely made; they must be complete in themselves, and if it appear that the dying man intended to qualify them, they cannot be received. See Taylor on *Evidence*.

DYKE, n. *dīk*: see DIKE.

DYKE-REEVE, or DYKE-REVE, n.: in *law*, an officer who has charge of the dikes and drains in fenny countries.

DYMOND, *dī'mond*, JONATHAN: 1796–1828, May 6; b. Exeter, England; son of a linen-draper, and followed the same trade. He was a member of the Soc. of Friends, and noted as a moralist, and wrote two works which are highly esteemed and have often been reprinted: *Inquiry into the Accordances of War with the Principles of Christianity* (1823), and *Essays on the Principles of Morality, and on the Private and Political Rights and Obligations of Mankind* (published after his death, 1829).

DYNACTINOMETER, n. *dī-năk-tī-nŏm'ě-tér* [Gr. *dunamis*, power; *aktinos*, a ray or beam, and *metron*, a measure]: in *optics*, an instrument for measuring the intensity of the photogenic rays of light, and computing the power of object glasses.

DYNAM, n. *dī'năm* [Gr. *dunamis*, power]: in *Eng.*, a term used to express a unit of work equal to a weight of one pound raised through one foot of space in one second; a foot-pound.

DYNAMICS, n. plu. *dī-năm'iks* [Gr. *dunamikos*, powerful—from *dunamis*, power]: the science that treats of the laws regulating the force or power of moving bodies. DYNAM'ICAL, a. *-ĭ-kăl*, pertaining to dynamics; also DYNAM'IC, a. *-ĭk*. DYNAM'ICALLY, ad. *-lĭ*. DYNAMIC UNITS, units for measuring forces and their effects. The *unit of force* is that force which will impart a unit of velocity to a unit of mass; the English and American unit

## DYNAMICS.

of force is one lb. avoirdupois; and the corresponding unit of mass is one lb. divided by 32.16. The *unit of work* is the force which will raise a unit of weight through a unit of space; the two items are indicated in the term *foot-pound*. The horse-power is a merely conventional and arbitrary unit which equals (American) 33,000 foot-pounds per minute (see HORSE POWER). DYNAMOMETER, n. -mōm'-ē-tēr [Gr. *metron*, a measure]: instrument for measuring the relative strength of men and animals, etc. DYNAMITE, n. dī'na-mīt or dīn'ă-, powerful explosive agent, consisting of porous silica, saturated with nitro-glycerine (see NITRO-GLYCERINE: EXPLOSIVES). DYNAMETER, n. -ē-tēr [Gr. *metron*, a measure]: instrument for ascertaining the magnifying power of telescopes; the magnifying power is found by measuring the diameter of the image formed at the solar focus and seen through the eye-piece. DYNAMISM, n. dī'-nam-izm, the doctrine of Leibnitz, that all substance involves force. DYNAMET'RICAL, a. dīn'a-mēt'rī-kāl, pertaining to a dynameter. DYNAMIC-ABSORPTION, n. in *nat. philos.*, the absorption of heat when dynamic chilling takes place. DYNAMICAL ELECTRICITY, n. current electricity. DYNAMIC CHILLING, n. in *nat. philos.*, the chill or cold produced when a tube full of gas or vapor is rapidly exhausted; the missing heat has gone to produce motion. DYNAMIC ENERGY, n. in *nat. philos.*, the force contained in a moving body. DYNAMIC HEATING, n. in *nat. philos.*, the heat imparted to the particles of a gas when the latter is entering an exhausted tube. It is produced by the collision of the particles against the sides of the vessel. DYNAMIC-RADIATION, n. in *nat. philos.*, the radiation of heat when the dynamic heating of gas takes place. DYNAMIC-THEORY, n. theory now largely accepted, which represents a heated body as being simply a body the particles of which are in a state of vibration. This vibratory movement is supposed to increase as the body is still more heated, and diminishes proportionately as it more or less rapidly cools. It is called also the mechanical theory of heat. See HEAT: THERMO-DYNAMICS.

DYNAMICS: division of mechanics (q.v.) which contains the doctrine of the motion of bodies produced by forces. It is essentially a science of deduction from the laws of motion (see MOTION, LAWS OF), under which head see also a sketch of the growth of the science. For various branches of D. see the separate titles. The following is a view of the main branches and their correlation.

I. The first branch of D. deals with the fundamental conceptions of the science, their names and definitions, such as velocity (q.v.) and the different kinds of motion (q.v.), and accelerated motion (q.v.); force, accelerating force, and moving force (see FORCE). Under this branch also falls the composition of motions (see COMPOSITION OF FORCES AND MOTIONS). II. The second main branch of D. treats of the motion, free or constrained, of points. Here two problems are solved in each case—i.e., whether the motion be free or constrained—viz., a direct and an inverse problem; as, for example: 1. To determine the path of a point when the forces are given which act upon it; 2. To determine the



## DYNAMITE—DYNAMITE GUN.

forces or force acting on a point when its path is given. This division of dynamical problems into direct and inverse, obtains in all the branches. It may be mentioned that it was by solving the inverse problem that Newton and Huygens effected their greatest glories in connection with D. The method of treating the case of a free point now generally employed, is due to Euler. See, under this head, CENTRAL FORCES: FALLING BODIES: PROJECTILES. III. The third main branch of D. is concerned with the motion of a rigid system of points, or of a solid body. Few of the sub-branches of this part of D. are capable of exposition in this work, but see CENTRE OF GYRATION: CENTRE OF OSCILLATION: CENTRE OF PERCUSSION: PENDULUM. The honor belongs to D'Alembert of establishing a general method of treating problems in rigid D. Previous to his time, each set of such problems was treated on some principle applicable peculiarly to itself. D'Alembert invented one (which bears his name) applicable to all such problems: for its statement, see RIGID DYNAMICS. IV. The fourth main branch of D. is concerned with motions of rotation. A system of rigid points may be subject to two independent kinds of motion. It may suffer a motion of *translation* in space, or a motion of *rotation* about some point or axis within itself, or it may suffer at once a motion of translation and a rotatory motion. These may be treated conjunctly or independently; they are now uniformly treated independently, by investigating, 1. The velocity and direction of the centre of gravity of the system; and, 2. The direction at each instant of the spontaneous axis of rotation passing through the centre of gravity (see ROTATION), and the velocity of the rotation of the system round that axis. To effect the second task, Poinsot proposed his theory of couples (q.v.). For the conservation of living forces (*virium viva rum*), and the principle of least action, see FORCES: see also MOMENT. Dynamics is used by some recent writers with a wider signification, as denoting the science which investigates the action of Force (1) in compelling rest or preventing change of motion, and (2) in producing or changing motion; the former branch being called *Statics*, and the latter *Kinetics*.—See STATICS: KINETICS: THERMO-DYNAMICS.

DYNAMITE: see EXPLOSIVES: NITRO-GLYCERINE.

DYNAMITE GUN, PNEUMATIC: see PNEUMATIC DYNAMITE GUN.

## DYNAMO-ELECTRIC MACHINE.

**DYNAMO-ELECTRIC MACHINE** (familiar abbrev., **DY'NAMO**): machine for generating electric currents by means of the relative movement of conductors and magnets. Faraday discovered 1831 that an electric current is induced in a conductor when it is moved across the pole of a magnet, so that it cuts the lines of magnetic force, or (more generally) whenever the number of these lines which passes through the circuit of the conductor is in any way varied. If, e.g., a coil of wire, whose ends are connected so that the whole forms a closed circuit, be suddenly withdrawn from the pole of a magnet, a transient electric current is induced in it, while the lines of magnetic force which proceed from the pole are ceasing to be present within the coil. If the coil be replaced, a current will again be induced, but in the contrary direction. Similarly, a transient current is induced if the coil be held at rest while the magnet is drawn away; or, again, if the coil be turned round so that the direction of the lines of force through it becomes reversed, in which case the effect will be twice as great as before. Any movement which causes an alteration to take place in the amount of magnetic induction through the coil produces a transient current, the electromotive force of which is proportional to the rate at which this alteration takes place. The whole amount of electricity produced is the same whether the movement be fast or slow. When the movement is slow, the current lasts longer in proportion as its strength is less. To produce the movement requires an exertion of mechanical work,

which finds its equivalent in the energy of the induced current. —See **MAGNETISM**.

Faraday's discovery was followed immediately by the invention of numerous forms of magneto-electric machines, as they were then called, in most of which a steel horseshoe magnet was made to rotate over a pair of coils wound on a fixed armature, or the armature and coils were made to rotate while the magnet was held fixed. Fig. 1 is an example of one of these early forms, in which the armature, BB, with the bobbins, C, D, which consist of coils wound upon iron cores fixed to the armature, revolves in front of the magnet poles, N, S. In every half-revolution the lines of magnetic force through the bobbins have their direction reversed, and a series of transient currents are consequently produced

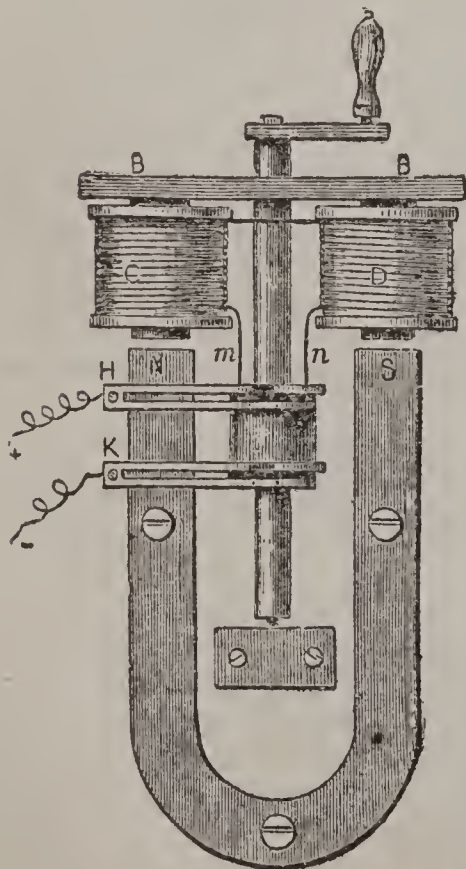


Fig. 1.

a series of transient currents are consequently produced



# DYNAMO-ELECTRIC MACHINE.

in the coils. These pass to the external part of the circuit through the spring brushes, H, K, which make contact with a revolving collector, consisting of insulated metallic rings on the axle, to which the ends,  $m$ ,  $n$ , of the coils are attached. If  $m$  were always in contact with H, and  $n$  with K, it is obvious that each successive transient current would take the direction opposite to its predecessor—the direction of the current would alternate at every half-revolution. On the other hand, it is easy, by splitting the rings, to arrange the collector so that H is in contact with  $m$  for half a revolution, and then with  $n$  for the other half, while K is in contact first with  $n$ ,



Fig. 2.

and then with  $m$ , with the effect that the successive currents all have the same direction in the external portion of the circuit. The collector is then called a commutator. A common form of commutator is shown in fig. 2.

An ideally simple form of dynamo is shown diagrammatically in fig. 3, which represents a conductor consisting of a single loop of wire revolving in the magnetic field between the poles of a magnet, NS, so that

at every half-revolution the lines of force have their direction of passing through the loop reversed, and a series of transient currents is consequently induced in the loop. Here, again, a commutator is required if the currents are

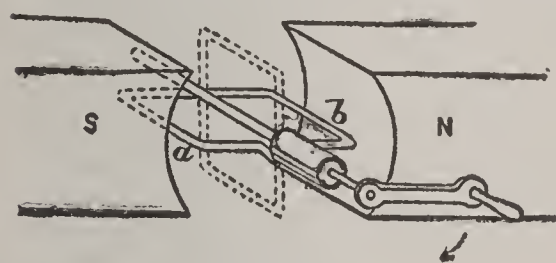


Fig. 3.

to have one continuous direction in the external portion of the circuit. In the position sketched (by full lines), the side,  $a$ , of the rectangular loop is cutting the lines of force in one direction, and the side,  $b$ , is

cutting them in the other, and both these movements are contributing to produce electromotive force in one direction round the loop; the other two sides (i.e., the front and the back) of the loop do not cut lines of force, and therefore do not contribute to production of electromotive force. As the loop approaches the vertical position (shown by dotted lines), the component motion of the sides across the lines of magnetic force becomes reduced, and the electromotive force diminishes, till, at the vertical position, it disappears entirely, for there the sides of the loop are moving (at the instant) along the lines of force. After that they begin to cut the lines of force again, but in the reverse direction, and an electromotive force opposite to the last begins to act, which reaches its maximum when the coil is again horizontal. The same variations are repeated as the coil turns through the remaining half of its revolution. The strength of the current follows similar fluctuations, being determined by the electromotive force and by the resistance of the circuit, including the resistance of the revolving loop itself.

## DYNAMO-ELECTRIC MACHINE.

The effect of the revolving conductor in producing electromotive force may be increased (1) by increasing the speed of rotation; (2) by forming the loop with more than one turn of wire so as to make a coil—the whole effect is then the sum of the effects due to the individual turns; (3) by strengthening the magnetic field. One very important method of doing this is to furnish the revolving coil with an iron core, whose effect is to increase the magnetic induction through the loop, across the space from pole to pole, by providing an easier path for the lines of magnetic force to cross this gap. In early dynamos the armature (as the revolving piece is called) frequently consisted of a coil of many turns wound on an iron core, illustrated by fig. 4, which shows in section the simple shuttle-wound armature introduced by Siemens 1856. The ends of the coil were brought to a commutator like that of fig. 2, and the effect was to produce currents which were uniform in direction. They were, however, very far from uniform in strength, varying from zero to a maximum twice in every revolution of the shaft.

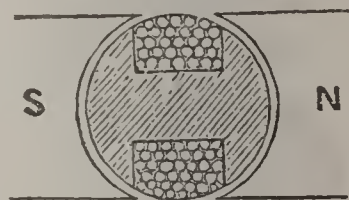


Fig. 4.

In the early dynamos permanent steel magnets were used to produce the field in which the armature moved, but it was soon recognized that electro-magnets might be employed instead, and in 1863 Mr. Wilde introduced a machine with large electro-magnets, which were excited by a small auxiliary armature revolving between the poles of a permanent magnet. Before this it had been proposed in machines with permanent magnets to supplement the magnetism when the machine was in action, by having coils wound upon the magnets, and by allowing the current produced in the machine itself to pass through these coils. It was not till 1867, however, that it became known that steel magnets were wholly unnecessary, and that dynamos with electro-magnets might be made entirely self-exciting. Even when the cores of the electro-magnets are of soft iron, there is enough residual magnetism to initiate a feeble current; this develops more magnetism, which in its turn develops more current, and so the process goes on until full magnetization is reached. The principle of self-excitation was enunciated independently, and almost simultaneously, by Wheatstone, Werner Siemens, and S. A. Varley; it is now applied in all except the smallest machines. The term 'dynamo-electric' was used at first to distinguish those machines which were self-exciting from 'magneto-electric' machines, which had permanent magnets to give the field; but this distinction is no longer maintained, and the name 'dynamo' is now used in the wider sense defined above.

An extremely important step in the development of the dynamo was taken 1870 by Gramme, who introduced a form of armature which, for the first time, gave a current not merely continuous in direction, but also sensibly uniform in strength. The Gramme ring armature, shown



## DYNAMO-ELECTRIC MACHINE.

diagrammatically in fig. 5, consists of a ring-shaped iron

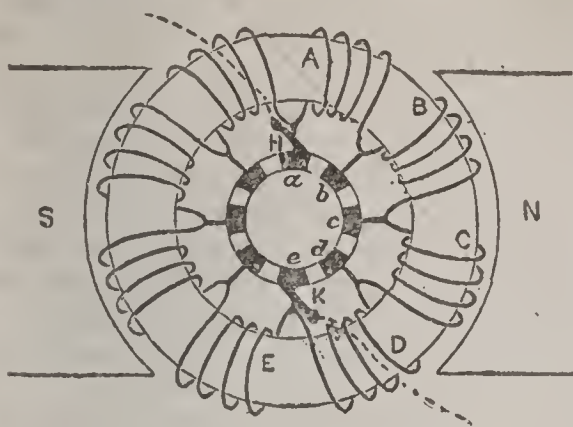


Fig 5.

core, revolving in the magnetic field, and having a series of coils, A, B, C, etc., wound upon it. These are joined to one another in a continuous series, also to the insulated segments of a commutator, *a*, *b*, *c*, which revolves with the ring, and from which the current is taken

by brushes, H, K. Consider now the action of the field in producing electromotive force in any one of the coils, such as A. Near the place in which it is sketched, the coil A is moving in a direction parallel, or nearly parallel, to the lines of force, therefore is having little or no electromotive force induced in it. But by the time the ring has made half a revolution, the same coil will have the lines of force within it reversed. Between these two positions, therefore, there must have been a generation of electromotive force, and this will in fact be going on most actively half-way between the two places. The coil C is at present the most active contributor of electromotive force, but B and D, the coils lying in front of and behind it, also are contributing a share; and the whole electromotive force between A and E, so far as that side of the ring is concerned, will be the sum of the several effects due to all the coils from A to E. A little consideration will show that the same action is going on on the other side of the ring, so that if the brushes be applied at *a* and *e* they will take off to the external portion of the circuit a current, half of which is contributed by one side, and half by the other side of the ring, the two sides acting like two groups of battery cells arranged in parallel and of equal resistance and equal electromotive force. The whole electromotive force in the armature is the same as that produced by the coils on one side alone, but the internal resistance is halved by the division of the current between the two sides. In actual Gramme armatures, the number of coils on the ring is very much greater than the number shown in the sketch, and each brush is made wide enough where it presses on the commutator to touch two of the segments at once. Hence the current is never interrupted, and the fluctuations in its strength, which occur as one segment passes out of contact and another comes in, may be made almost indefinitely small. As each coil passes, it is for the instant short-circuited through the brush, and this would give rise to a waste of energy in the coil and to sparking at the brushes, were it not that the brushes are set to bear on the commutator at the points where the development of electromotive force in the corresponding pair of coils is a minimum. These neutral points, as they are called, are not exactly

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midway between S and N, but are in advance of that position in consequence of the magnetic field within the ring being distorted through the action of the currents in the armature coils. Hence the brushes require to have what is called 'lead,' and this lead has in general to be adjusted whenever the output of the machine is considerably varied, more lead being needed if it happen that the armature current is increased while the field magnets remain of constant, or nearly constant, strength. The adjustment of the brushes is of much practical importance in management of a dynamo; for the sparking to which faulty adjustment gives rise speedily wears away the commutator bars as well as the brushes themselves.

A small practical Gramme dynamo of an early form is shown in fig. 6. In this example two field-magnets conspire to produce a n. pole at N, and other two to produce a s. pole at S. The commutator is a series of copper bars

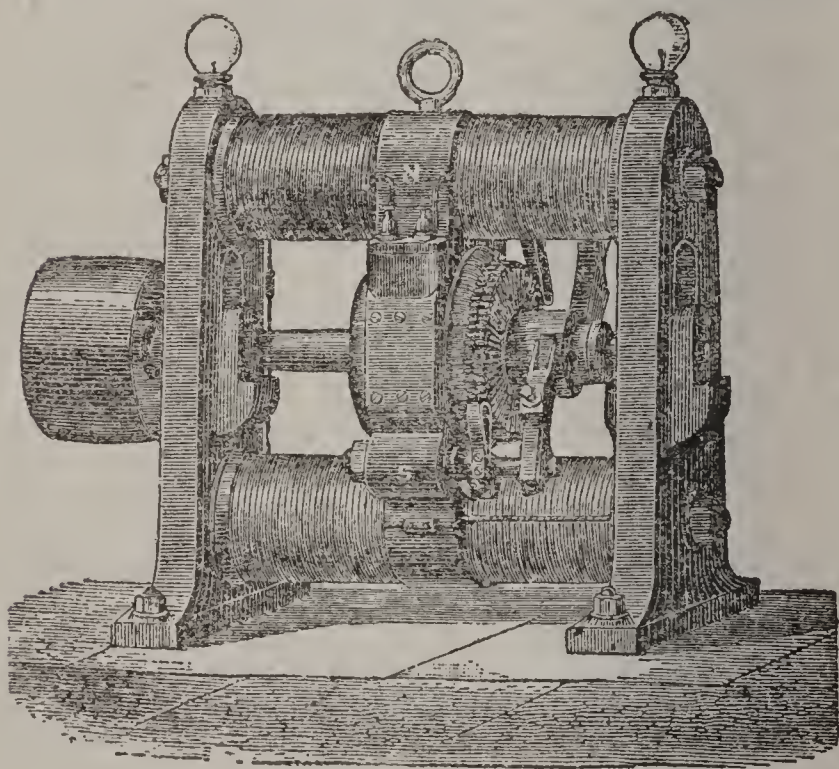


Fig. 6.

mounted on an insulating hub fixed to the shaft, and separated from one another by thin stripes of mica or other insulating material; these bars have radial projections, soldered to the junctions of successive armature coils. Each brush consists of a flat bundle of copper wires pressed lightly against the commutator by a spring. The core of the armature is a ring made of many turns of soft iron wire, on which insulated copper wire is wound to form the coils. It is essential that the core of the armature should not be solid, for in that case currents would be developed in the substance of the moving iron itself to such an extent as very seriously to impair the efficiency of the machine. Hence the core of dynamo armatures is always sub-divided, by being made either of wire, or more usually of thin plates more or less carefully insulated from one another,



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Fig. 7 shows the armature of a small Gramme dynamo, removed from its place between the pole-pieces.

Two years after the introduction of the ring armature by Gramme, it was shown by Von Hefner-Alteneck that the Siemens armature (fig. 4) might be modified so that it also should give continuous currents of practically constant strength. In the original Siemens armature there was but one coil, all wound parallel to one plane, and the current fluctuated from nothing to a maximum in every half-revolution. In the modified form the coil is divided into many parts, which are wound over the same core, but in a series of different planes, the plane of each successive coil being a little inclined to the plane of the coil before it. The coils all are joined in series, and their junctions are connected to the bars of a commutator as in the Gramme ring. The Siemens-Alteneck or drum armature may, in fact, be compared to a Gramme armature, in which the coils, instead of being wound on successive portions of a ring, are all wound on one piece of core, preserving, however, the angular position that they would have in the ring. Their action depends on their angular motion, and is therefore

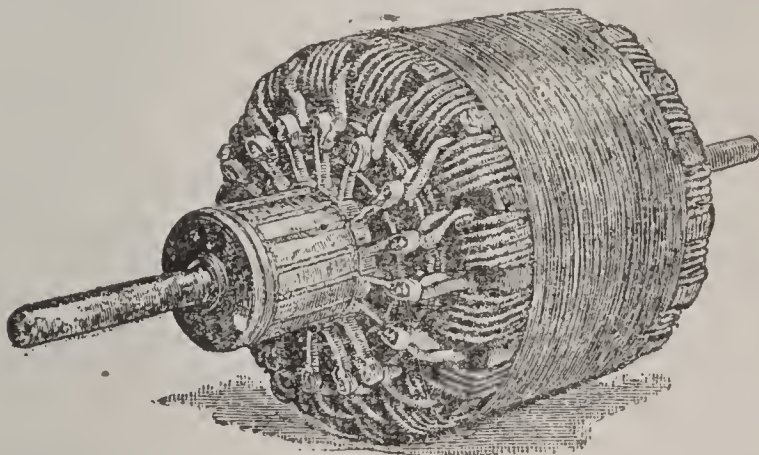


Fig. 7.

the same in both cases. As the drum revolves, that coil which is passing the neutral plane (viz., the plane perpendicular to the lines of force) is for the moment inoperative, and the brushes are set to touch those bars of the commutator that are connected with it. The other coils are more or less operative, the most active contributor of electromotive force being that one which is for the moment perpendicular to the neutral plane. The electrical effects in drum and in ring armatures are the same. Nearly all continuous current dynamos have one or the other; most makers prefer the ring type, mainly from considerations of convenience in construction; but the drum type holds its place in some of the best modern machines.

An important element in the classification of dynamos is the manner in which magnetism is induced in the field-magnets. These may of course be excited from an independent source of electricity; but when the machine is self-exciting, there are three important alternative methods. In the early machines the coils on the field-magnets were connected in series with the external part of the circuit;

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consequently the whole current produced by the machine passed through both. This arrangement is distinguished as *series winding*, and is shown diagrammatically in fig. 8. It was first pointed out by Wheatstone, 1867, that the magnet coils, instead of being put in series with the external conductor, might be arranged as a shunt to it, thereby forming an alternative path through which a portion only of the

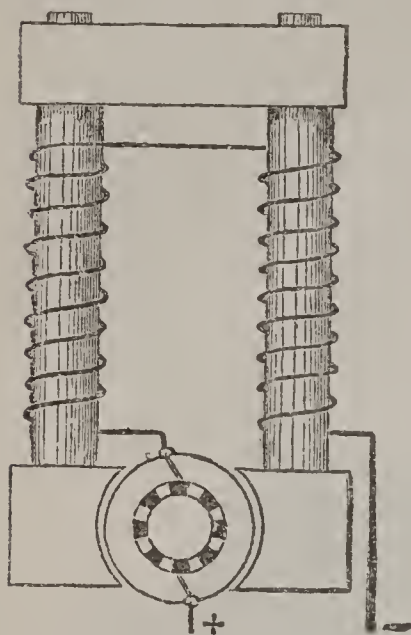


Fig. 8.

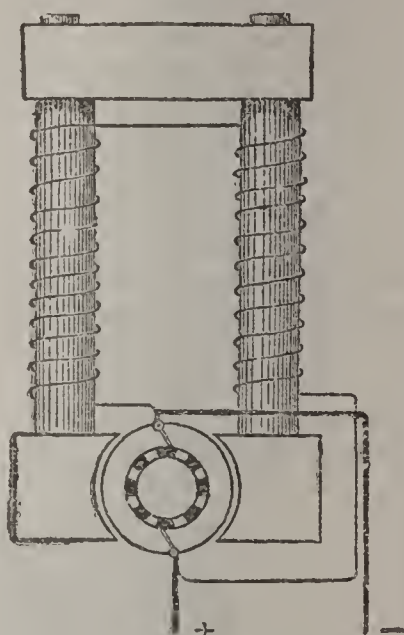


Fig. 9.

current would pass. In this arrangement, which is called *shunt winding* (fig 9), the magnet coils consist of many turns of comparatively fine wire, so that they may not divert an excessive quantity of current from the external circuit. Finally, in *compound winding* (fig. 10) the two previous methods are combined. The field-magnets are wound with two coils; one of these (short and thick) is connected in series with the external circuit, and the other

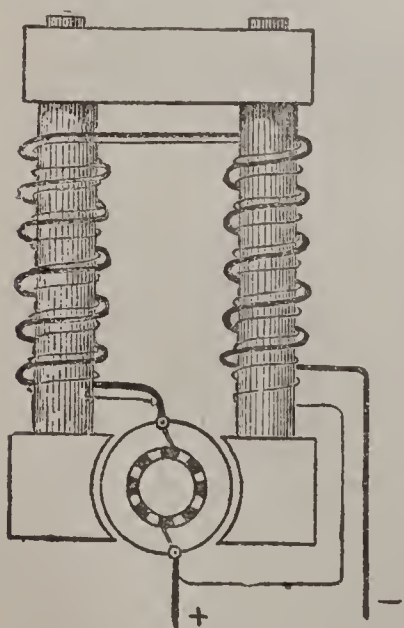


Fig. 10.

(long and fine) is connected as a shunt to it. This plan appears to have been used first by Varley, 1876, and afterward by Brush, who pointed out that it, with simple shunt winding, has the advantage of maintaining the magnetic field even when the external circuit is interrupted. It has, however, when properly applied, another and more important merit, as will appear below.

In a series-wound dynamo the magnets do not become excited if the external circuit is open, and become only feebly excited when the external resistance is high. Let the external resistance be reduced, while the armature is forced to turn at the same speed. The current will now in-



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crease, producing a stronger magnetic field; the electromotive force is therefore greater than before. A curve drawn to show the relation between the current and the difference of potential between the terminals of the machine (which is a little short of the full electromotive force, in consequence of the resistance of that part of the circuit which is within the machine itself) will in its early portion rise fast as the current increases, in consequence of the rapid augmentation of the magnetic field. Such a curve is called the characteristic curve of the machine, and is shown at AA in fig. 11. If we continue to increase the current by further reducing the external resistance, the magnets tend to become saturated, and finally even have their magnetism somewhat weakened on account of the influence of the currents in the armature coils. Further, the loss of potential, through internal resistance, becomes more considerable. The difference of potential between

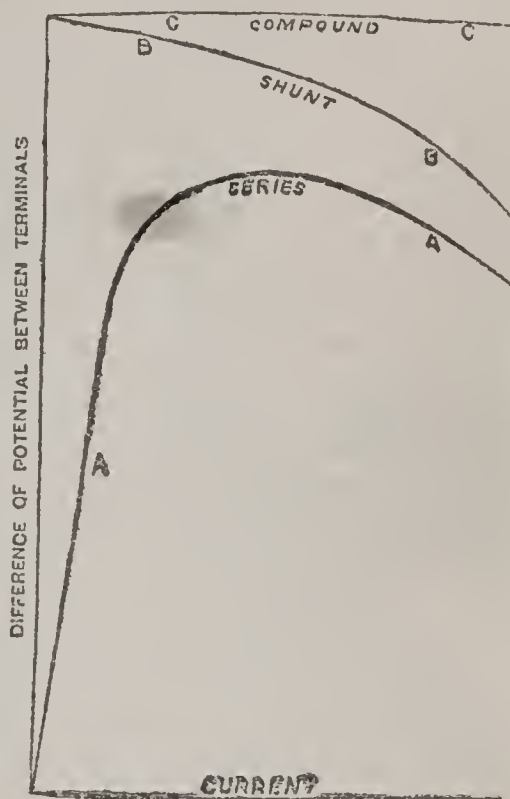


Fig. 11.

between the terminals accordingly passes a maximum, and becomes considerably reduced when the current is much augmented, as appears in fig. 11. The characteristic curve for a shunt-wound dynamo is shown at BB in the same figure. Here the strength of the magnetic field is nearly constant, but decreases a little when the machine is giving much current, partly because the current in the shunt circuit is then somewhat reduced, partly because the current in the armature coils tends to oppose the magnetization. Hence the potential falls off as the current increases. This fall will, however, be slight if the resistance of the armature is very low and if the field-magnets are very strong, and under these conditions a shunt-wound dynamo will give a nearly constant difference of potential whether much or little current be taken from it, provided, of course, that the speed remain unchanged. To make the difference of potential more exactly constant, it is necessary that the magnetic field should become stronger when the machine is giving much current, and compound winding achieves this. A compound-wound dynamo may be regarded as a shunt machine in which the action of the shunt winding is supplemented by that of a series coil on the magnets. When the machine is running on open circuit, the shunt coil alone is operative; as the current taken from the machine is increased, the series coil produces a larger and

## DYNAMO-ELECTRIC MACHINE.

larger supplementary effect on the magnets; and by choosing a proper number of series windings, their effect may be made to neutralize with great exactness the droop in the characteristic curve which would occur if the shunt coil were the only source of magnetism. Compound machines wound for constant potential give a nearly straight horizontal line for their characteristic; CC in fig. 11 is an actual example. By making the series coil more influential, so that the potential at the terminals rises slightly as the current increases, the machine may be compound-wound to give constant potential at the ends of long leading-wires by which the current is conducted to a distance.

Series-wound dynamos are largely employed for electric lighting by arc lamps. Compound-wound machines are especially suitable for incandescent lighting, where the lamps are connected in parallel, and where it is important that the potential shall not vary when more or fewer lamps are in action. Shunt-wound machines are also largely used for incandescent lighting, the potential being adjusted to a constant value by varying the speed of the machine, or by throwing resistance into or out of the magnet shunt circuit. Shunt machines are the most suitable for charging storage batteries and for electroplating, because of their not being liable to have their polarity reversed by a back current from the battery or bath.

Fig. 12 illustrates the Edison-Hopkinson dynamo—an excellent instance of modern construction. Here a drum armature is used, not a ring; and in this instance the armature coils, instead of being of wire as in smaller machines, are of copper bars insulated with mica, each pair of opposite bars being joined to form a loop whose ends are connected to opposite segments of the commutator, as well as to the loops which come next in order. The field-magnets are shunt-wound, and are set vertically with the pole-pieces at the bottom. Machines of this class are made of sufficient size to give a current of 660 ampères, with a potential of 105 volts; the output of electrical energy is therefore at the rate of 69,300 watts, or more than 92 horsepower. There are five brushes on either side of the commutator, giving a large area of contact, and these are separately removable to allow of their being trimmed or cleaned while the machine is running.

In most dynamos the field-magnets are designed to form as simple a magnetic circuit as possible, with two poles which stand at opposite ends of one diameter of the commutator. In some cases four or more poles are used, spaced at equal intervals round the armature, which then takes more or less the form of a disk, in which the similarly affected coils may be connected together, so that a single pair of brushes still serves to take off the current. In some cases the coils are connected to commutators of special design, which have the effect that each coil is entirely cut out of circuit for a time, during that part of its movement in which there is little or no electromotive force induced in it. The Brush dynamo, prominent in the early



## DYNAMO-ELECTRIC MACHINE.

industrial development of electric lighting, and the Thomson-Houston dynamo, are instances in point.

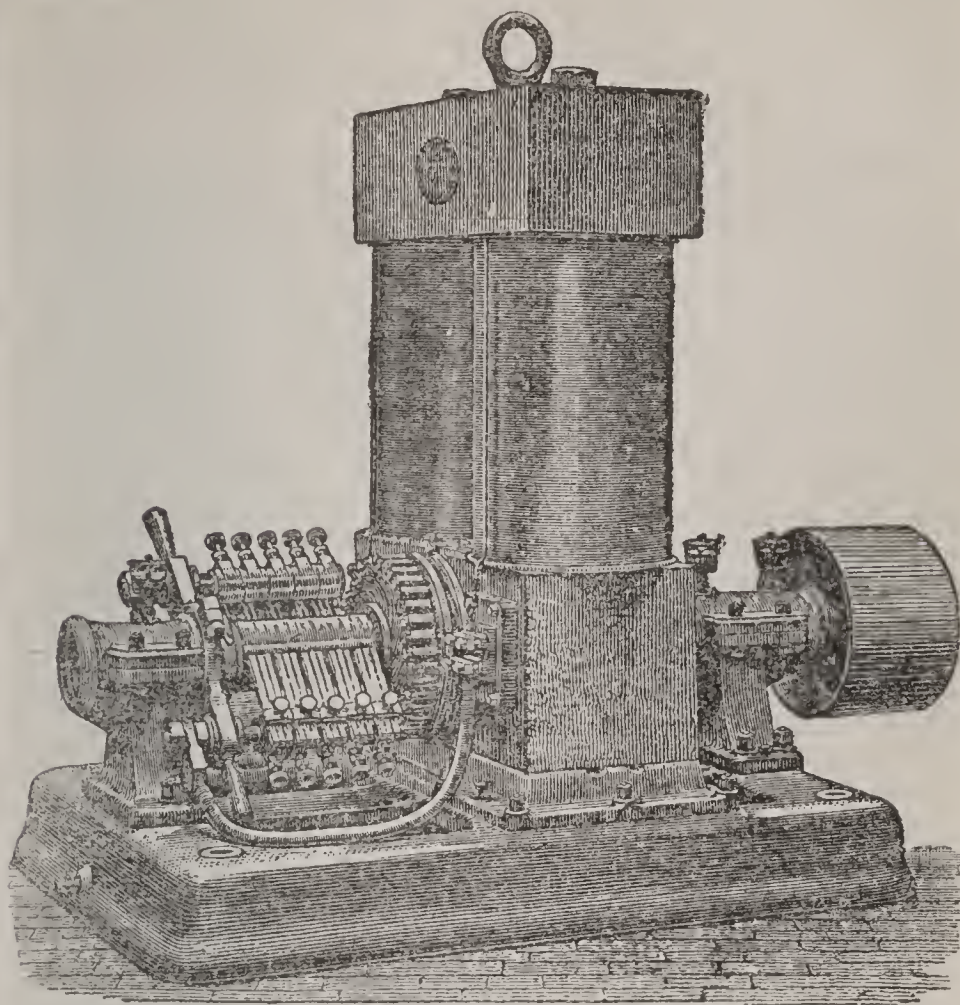


Fig. 12.

In *alternate current dynamos* the armature consists usually of a group of coils, joined in parallel or series, attached to a disk which revolves in the space between a corresponding group of pairs of magnet-poles, so that rapidly alternating transient currents are induced as the coils pass the successive poles, and these currents pass to the external circuit through a simple collector which is not a commutator. In some cases the armature is stationary, and the field-magnets revolve. The field is usually excited by an auxiliary dynamo of the continuous current type. It is impossible in the space at our disposal to describe the great variety of forms which alternate current machines have taken in the hands of Siemens, Gordon, Ferranti, Westinghouse, Mordey, and others. Dynamos of this class are now acquiring special importance from their use in connection with transformers in Electric Lighting (q.v.), and are being made for this purpose of very great size and power. In alternate current dynamos, the relation between the strength of the current and electromotive force induced in the moving coils depends not merely on the resistance of the circuit, but also on its coefficient of self-induction, which has the effect of making the maximum of strength in each transient current lag behind the maxi-

## DYNAMO-ELECTRIC MACHINE.

num of electromotive force. It has been shown experimentally and theoretically, by Adams and Hopkinson, that in consequence of self-induction two similar alternate current machines driven independently, but started at the same speed, and connected in parallel, will control one another, so that the phases of the currents will continue to agree. —See ELECTRIC LIGHT.

Dynamos, of whatever type, may be regarded as machines for converting energy from a mechanical into an electrical form, and from this point of view a matter of prime importance is what is called the efficiency of the machine, which is the ratio of the electrical power that the dynamo gives off, available for use outside the machine, to the power used to drive the machine. The electrical energy given off falls short of the mechanical energy absorbed, in consequence of (1) mechanical friction; (2) the generation of eddy currents, to be prevented as much as possible by laminating the iron core of the armature; (3) magnetic friction or 'hysteresis,' by which every reversal of magnetism in the iron causes dissipation of energy, apart from the production of eddy currents; (4) the energy consumed in maintaining the magnetic field; and (5) the heating of the armature in consequence of the resistance of its own coils. The aggregate effect of these sources of loss is that in a good machine about 90 per cent. of the driving power is available as electric energy in the external circuit. Dr. Hopkinson has shown by careful measurements that machines of the type illustrated in fig. 12 may attain an efficiency of over 93 per cent.

*The Dynamo as a Motor.*—Just as a conductor when made to move across the lines of magnetic force has a current generated in it, so when a current is made to pass along a conductor placed in a magnetic field, the conductor tends to move across the field in the direction which would reduce the current by inducing an opposing electromotive force. Even before Faraday's discovery of the induction of current in a conductor by its movement in a magnetic field, he had shown (1821) that the reverse process was possible and soon afterward various forms of magneto-electric engines were devised by Barlow and Sturgeon, and later by Ritchie, Henry, Dal Negro, Joule, and others, which employed electric currents to do mechanical work on a small scale. In 1838 Jacobi constructed an electric motor of sufficient power to propel a small boat, using a group of electro-magnets, which revolved on a disk between opposite groups of other electro-magnets which were fixed. Some time before the application of the ring-armature to dynamos by Gramme, it had been used in a motor by Pacinotti, and the principle had been explicitly stated that any electric motor might be used to produce currents, but it was not until Gramme's time that the full significance of this principle was generally recognized. The action of the dynamo is in fact reversible; the same machine which converts mechanical into electrical energy will serve the opposite function equally well. Power may therefore be conveyed to any distance by using a dynamo to produce



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currents, conducting these to the distant spot, and utilizing them there to produce mechanical effect by means of another dynamo acting as a motor. The second dynamo may be a counterpart of the first; in some cases, however, it may be desirable, for the sake of lightness or for other special reasons, to adopt a different construction in the motor. In general, however, the most efficient generator is also the most efficient motor. The experiments of Hopkinson, in a case where some 50 horse-power was being transmitted in this way, show that the double conversion of energy from the mechanical to the electrical, and back again to the mechanical form, may be accomplished with a total loss of no more than 13 per cent.; the efficiency of the motor and that of the generator being each more than 93 per cent.

Alternate current dynamos form fairly efficient motors when driven by alternate currents; they require, however, to be started in synchronism with the impulses received from the generating machine, but once started they tend to remain in synchronism. Special forms of motor for alternate currents have been designed by inventors, the three phase induction motor being the cheapest in cost and simplest in operation, requiring no commutator.

Among many important contributions to the theory of dynamos, perhaps the most noteworthy are papers by J. Hopkinson (*Proc. Inst. Mech. Eng.* 1879-80), in which were explained the construction and uses of curves, such as those of fig. 11 (afterward called characteristic curves by Deprez); by J. and E. Hopkinson (*Phil. Trans.* 1886), in which it was shown how the strength of the field and the performance generally of a dynamo might be predicted by calculation of the induction in the magnetic circuit of the machine; by Joubert (*Jour. de Physique*, 1883), on alternate current machines; and by Ayrton and Perry (*Jour. Soc. of Telegraph Engineers*, 1883), on regulation of motors. For descriptive articles, see the *Electrician*, the *Electrical Review*, and *Engineering* from 1878. The whole subject is comprehensively and systematically treated in Professor S. P. Thompson's *Manual of Dynamo-electric Machinery* (3d ed. 1888).

## DYNAMOMETER – DYSCHROA.

**DYNAMOMETER:** originally an instrument for measuring force, such as the pull exerted by a horse in drawing a cart; but the name is now usually given to instruments for measuring power. A friction brake, e.g., applied to a drum on the shaft of a steam-engine, may be arranged so that it measures the rate at which the engine is doing work on the brake: the device then forms an *absorption dynamometer*. There are also various *transmission dynamometers* which measure the power conveyed by a belt or by a shaft without absorbing it.

**DYNASTES**, n. *dī-nās'tēz* [Gr. *dunastēs*, a master or ruler]. in *entom.*, a genus of coleoptera, the typical one of the family *Dynastidæ*. They are the largest beetles of the order, and come from India, S. America, etc., but none from Great Britain. **DYNAS'TIDÆ**, -tī-dē, family of lamellicorn coleopterous insects. They are remarkably powerful, and may be regarded as the giants of the coleoptera. They burrow in the earth and in putrescent timber, on which they chiefly feed. They are natives mostly of tropical countries. They include the Atlas-beetle, the Elephant-beetle, the Hercules-beetle, etc.

**DYNASTY**, n. *dī'nas-tī* or *dīn'ās-tī* [Gr. *dunastei'a*, lordship—from *dunas'tes*, a lord or chief: F. *dynastie*]: a race or succession of kings of the same family or line. **DYNASTIC**, a *dī-nās'tik*, relating to a dynasty; also **DYNASTICAL**, a. -tī-kāl.

**DYNE**, n. *dīn* [Gr. *dunamis*, power]. in *phys.*, a unit of force; the force which, acting upon a gramme for a second, generates a velocity of a centimetre per second.

**DYOXYLITE**, n. *dī-ōks'ī-līt* [Gr. *duo*, two, *oxus*, sharp, *lithos*, stone]: same as **LANARKITE**.

**DYRRACHIUM**: see **DURAZZO**.

**DYS**, *dīs* [Gr. *dus*]: a Gr. prefix only used in composition, and indicating difficulty, badness, evil, as opposed to Gr. **EU**, signifying goodness.

**DYSÆSTHESIA**, n. *dīs'ēz-thēz'ī-ă* [Gr. *dus*, badly; *ais-thănōmai*, I feel]: in *path.*, impaired power of feeling.

**DYSART**, *dī'zart*: royal, parliamentary, and municipal burgh and seaport in the south of Fifeshire, Scotland, on the rocky shore of the Firth of Forth, 12 m. n.e. of Edinburgh. It chiefly consists of three streets, with a small square. In the High Street are many antique houses, with inscriptions and dates. It has ship-building, flax-spinning, and manufactures of damasks and ticks. In the vicinity are coal and ironstone mines. Pop. (1891) 3,022.

**DYASTER**, n. *dīs'ās'tēr* [Gr. *dus*, bad, ill; *astēr*, a star]: in *paleon.*, genus of irregular echinoids, the type of the family *Dysasteridæ*.

**DYASTERIDÆ**, n. *dīs-as-tēr'ī-dē* [mod. L. *dysaster*]: in *paleon.*, family of irregular echinoids, found in the Oolite and Chalk; called also *Collyritidæ*.

**DYSCHROA**, n. *dīs'krō-a* [Gr. *dus*, ill; *chroia*, color]: in *med.*, a discoloration or discolored state of the skin.



## DYSCRASIA—DYSGENESIS.

**DYSCRASIA**, n. *dīs-krā'zī-ă* [Gr. *duscrāsia*, a bad mixture—from *dus*, an inseparable particle, denoting 'with pain, with difficulty, badly'; *krasis*, a mixture]: a pathological term much used in Germany by certain authorities, to indicate an altered condition of the blood and fluids of the system, leading to constitutional diseases, as dropsy, cancer, delirium tremens, lead poisoning, etc. See **CACHEXIA** and **DIATHESIS**.

**DYSENTERY**, n. *dīs'ĕn-tēr-ĭ* [Gr. *dusĕntēr'ia*, a flux—from *dus*, badly; *entera*, the bowels]: a flux or looseness of the bowels, accompanied with a discharge of blood and mucus, and griping pains. **DYS'ENTER'IC**, a. *-ik*, pertaining to or proceeding from dysentery.—*Dysentery* differs from diarrhœa (q.v.) chiefly in being attended by marked fever and pain, as also by the presence of blood and inflammatory products in the discharges. Dysentery is, in fact, a disease of the mucous membrane of the colon (q.v.) or great intestine, and when severe, it is followed by the destruction of that mucous membrane to a great extent, the intestine becoming much contracted at intervals, especially in its lower part, and the evacuations being therefore apt to be retained, especially the solid portions. The most distinctive symptoms are excessive pain in evacuating the bowels, and frequent ineffectual attempts at evacuation (*tenesmus*), tenderness on pressure in the left side of the abdomen, discharges of blood mixed with mucus, and comparatively little fecal matter; these symptoms being accompanied or followed by intense fever, passing into early depression of strength. Dysentery is a disease of extreme danger in many cases, and should always be placed early under medical treatment. The best domestic plan, when medical advice cannot be at once procured, is to give a moderate dose of castor oil, guarded by 20 or 30 drops of laudanum, and then either Dover's powder in ten-grain doses every hour or two, or ipecacuanha wine in two or three successive teaspoonful doses at similar intervals, each with 10 or 20 drops of laudanum, according to the effect on the system. If vomiting is repeatedly produced, the dose of ipecacuanha wine should be lessened. If the pain and irritation of the bowels are extreme, the opium had better be given by a small injection (see **CLYSTER**) with starch, after the lower bowel has been well cleansed by a larger warm-water injection; and it will be well to repeat the simple warm-water injection at intervals throughout the treatment. Some authorities recommend a saline laxative, such as Rochelle salts, at the beginning, instead of castor oil. Cleanliness and pure fresh air are indispensable. Mustard-plasters on the abdomen, acting as counter-irritants, have been found very helpful. The diet may be of eggs, raw or nearly raw mixed with sherry wine, also toast and tea (weak); with rice-water as a beverage together with beef-tea. Dysentery, in its most severe forms, is commonly a disease of the tropical zone. It is often found in connection with inflammation of the liver.

**DYSGENESIS**, n. *dīs-jĕn'ĕ-sīs* [Gr. *dus*, with difficulty,

## DYSLYSIN—DYTISCUS.

and *genesis*, generation]: the condition of not breeding freely; infecundity; sterility.

**DYSLYSIN**, or **DISLYSINE**, n. *dis'li-sîn* [Gr. *dus*, difficult; *lusis*, solution]: in *chem.*, a neutrally resinous substance,  $C_{24}H_{36}O_4$ , so named from its insolubility in water, = cholic acid minus two molecules of water; an ingredient of *bilin* remaining undissolved after its solution and digestion; an organic substance soluble with difficulty in naphtha; turpentine, etc.

**DYSODILE**, n. *dis'ô-dîl* [Gr. *dusôdês*, fetid; *îlus*, mud]: yellow or grayish laminated bituminous shale or Tertiary mud, found often with lignite; evidently of animal origin, burning vividly and emitting a highly fetid odor.

**DYSOPSY**, n. *dis-ôp'sî* [Gr. *dus*, bad, ill; *opsis*, the sight]: in *med.*, dimness or weakness of sight.

**DYSPEPSIA**, n. *dis-pêp'sî* [Gr. *duspêpsiă*, difficulty of digestion—from *dus*, badly; *pepto*, I digest]: bad digestion; difficulty of digestion; also **DYSPEP'SY**, n. *-sî*. **DYSPEP'TIC**, a. *-tîk*, afflicted with dyspepsia; N. a person afflicted with bad digestion: see **INDIGESTION**.

**DYSPHAGIA**, n. *dis-fă'ji-ă* [Gr. *dus*, badly; *phageîn*, to eat]: in *med.*, difficulty of swallowing.

**DYSPHONIA**, *dis-fô'nî-a* [Gr. *dus*, difficult; *phônê*, sound of the voice]: difficulty of voice or of vocalization; a disease arising from various causes, and having a variety of forms, but most commonly some form of sore throat, with huskiness, coughing, and expectoration. See **APHONIA**: **LARYNX**: **THROAT**, **AFFECTIONS OF THE: VOICE**.

**DYSPHORIA**, n. *dis-fôr'î-a* [Gr. *dus*, hard, bad, etc.; *phorô*, bearing, carrying]: in *med.*, morbid restlessness, producing wakefulness at night; the disease or morbid symptoms colloquially termed the fidgets.

**DYSPNŒA**, n. *disp-nê'ă* [Gr. *duspoi'a*; L. *dyspnœă*, difficulty of breathing—from Gr. *dus*, badly; *pnêô*, I breathe]: a difficulty of breathing: see **ASTHMA**: **RESPIRATION**, **ORGANS AND PROCESS OF**.

**DYSTHETIC**, a. *dis thêt'ik* [Gr. *dus*, bad, ill; *thetos*, placed, situated]: in *med.*, relating to a morbid state of the blood-vessels, or to a bad state of the body, dependent mainly upon the state of the circulating system.

**DYSTOME**, a. *dis'tôm* [Gr. *dus*, bad, ill; *tomê*, a cutting]: in *min.*, having an imperfect fracture or cleavage.

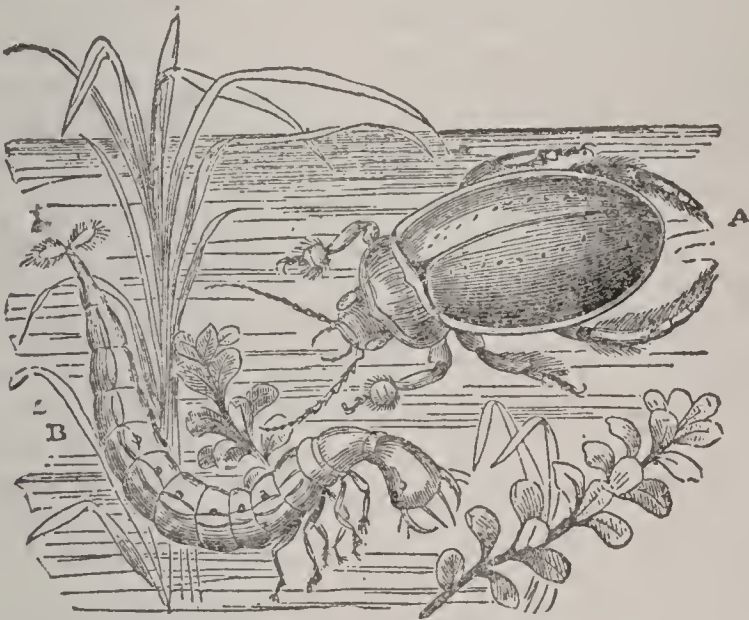
**DYSURIA**, n. *dis-û'rî-ă* [Gr. *dus*, badly; *ourêô*, I pass urine; *ouron*, urine]: difficulty in making urine; a morbid condition of the urine. **DYSURIC**, a. *-rîk*, pertaining to.—The causes of Dysuria are various: see **BLADDER**: **URINE**: **URETHRA**.

**DYTISCUS**, *dî-tîs'kûs* [Gr. *dytes*, a diver]: Linnæan genus of aquatic coleopterous insects or water-beetles, now forming the tribe or family *Dytiscidæ*. They are *pentamerous* coleoptera; that is, have all the *tarsi* five-jointed. Their general form is oval, the outline little broken, and the sur-



## DYVEKE.

face very smooth. The respiratory organs of the perfect insect are not adapted to the extraction of air from water, and it must occasionally come to the surface to breathe, where it rests for a short time back downward, and with the extremity of the abdomen exposed to the air, the openings of the air-tubes being in the last segment. The *Dytiscidae* are excessively voracious, feeding upon any kind of animal food, and boldly attacking creatures larger than themselves. They are very amusing inmates of the fresh-water aquarium, and sometimes live in it for a year or two, getting tame, and readily coming to be fed with small earthworms, bits of beef, etc. The species are numerous, and vary much in size, some being very small, and some almost two inches in length. A very common British species is *D. marginalis*, about an inch and a quarter in length, of a dark olive color, the thorax and outer sides of the elytra margined with yellow. All the species are found in lakes,



A, *Dytiscus Marginalis*, or great Water-beetle; B, larva.

ditches, marshes, and the still parts of rivers. They often leave the water by night, and can fly well. Their larvæ have the body long and tapering, composed of eleven rings or segments, besides the head. They hide themselves in the earth, in chambers which they make for themselves, before changing into pupæ.

DYVEKE, *dū've-kā* (i.e., *dove*): called by the Latin chroniclers *Columbula*: mistress of Christian II. of Denmark; 1488–1516; b. Amsterdam: often celebrated in works of poetry and fiction. Christian became acquainted with her in 1507 in Bergen, where her mother, Sigbrit Wylms, had settled as an innkeeper. She followed him to Opslow, and, when he had mounted the throne, to Copenhagen. Notwithstanding the marriage of Christian with Isabella, sister of the Emperor Charles V., his relation with D. was continued, and her mother acquired unbounded influence in the affairs of the country. Though

## DYVOUR—DZUNGARIA.

D. herself never interfered, she was naturally hated by the nobles; and her sudden death, 1516, was doubtless by poison. The king in vengeance put to death the gov. of the palace, Torben Oxe, who was believed to have sought D.'s favor, also the treasurer Faaburgh. The sad story has been the subject of novels and tragedies; e.g., *Dyveke*, by Samsøe, Danish poet; *Wilhelm Zabern*, by J. C. Hauch, a Dane; and Riekhoff's tragedy, *Düveke* (Berl. 1843).

DYVOUR, *dī'vûr*, AND DYVOUR'S HABIT [from the Fr. *devoir*, to owe; a debtor]: terms in the old legal language of Scotland. A dyvour was a bankrupt who, under various acts 1606-96, was compelled to wear a conspicuous and hideous costume. It was ordained 1606 that a pillory be erected near the Market Cross of Edinburgh, with a seat upon which dyvours shall be exposed once on a market-day, wearing a yellow hat or bonnet. Later acts prescribed a fuller costume to be worn continuously in public. This barbarism had fallen into disuse long before it was abolished by law 1836.

DZE'REN: see ANTELOPE.

DZIGGETHAI, *zīg'gè-tā*, or DJIGGETAI, *jīg'gè-tā*, or KIANG, *kī'ang*, or KHUR, *kûr*, or GOOR, *gôr* (*Equus Hemionus*): quadruped nearly allied to the ass, but horse-like; probably the *hemionus* (half-ass) of Herodotus and Pliny. See ASS. It inhabits the elevated steppes of Tartary, extending into s. Siberia and to the borders of India. In size, in gracefulness, and in neighing it resembles a horse, though its general shape is much like that of a mule. The D. lives in small herds, sometimes of several males and several females, sometimes of a single male with about 20 females and foals. It is very fleet, and shy or watchful, and has great powers of endurance. The Mongols and Tungûs hunt it eagerly for its flesh. It has been partly domesticated, but is not known to breed in that state.

DZUNGARIA, *zōng-gá'ri á*, or SOONGARIA, *sōng-gá'ri-á*: country of central Asia, forming part of the Chinese empire; bounded n. and w. by Russia, e. by the Chinese province of Kansu, s. by East Turkestan. It is an elevated and almost desert plateau between the Altai and Thian-Shan Mountains, and is intersected by subordinate ranges. Between the mountains are several fertile valleys, watered by numerous lakes, and cultivated by nomadic tribes. Millet and barley are the chief agricultural products; gold, silver, and iron are found in considerable quantities; and salt abounds in the lakes and mines. The country was originally inhabited by the Oo-Sun, distinguished from neighboring nations by their blue eyes and red beards. They were expelled by the Turks in the 6th c., and became subject to the Mongols. In 1754 the country was conquered by China, and has since been administered as a province of that empire, though a portion is claimed also by Russia. Pop. (est.) 600,000.



# E

E, or e, ē: fifth letter in the Græco-Roman alphabets, second of the English vowels. Its original and fundamental sound is that heard in Eng. *tent*. The sound heard in *me* is not given to it in any language but English. In the series of vowels it stands intermediate between *i* and *a*. For the various vowel-sounds represented by the character *e* in English, see LETTERS AND ARTICULATE SOUNDS.

E is used in *numerals* for 250; in *chem.*, for the element Erbium; in *chh. calendars*, E. is the 5th Dominical letter.

E: a prefix, meaning, 'out of; from': see Ex.

E, in Music: the third note or sound of the natural diatonic scale, and a third above the tonic C, to which it stands in proportion as 5 to 4. As a major third, that is, when the tonic C vibrates 4 times, the E above vibrates 5 times. E is the third harmonic which arises naturally from C as a fundamental note. E major, as a key, has 4 sharps at its signature, viz., F, C, G, and D sharp. E minor, as a key, has only one sharp, F, same as G major, of which E is the relative minor. E is used for the note Hypate in Greek music; the key-note of the church mode, called Phrygian; the note Elami in the system of Hexachords.

EACH, a. *ēch* [AS. *alc*; Low Ger. *elk*; Scot. *ilk*, each—from AS. *æ* or *á*, ever; *lic*, like]: one of two; every one of any number considered separately. The correspondent word to *each* is *other*; the two words are used elliptically

EADIE, *ē'dē*, JOHN, D.D., LL.D.: 1810-76; b. Stirlingshire, Scotland. He was educated at Glasgow University. As pastor of the Secession Church in Glasgow, he took part in the union which constituted the United Presbyterian Church (q.v.), and soon became known for his works on Biblical criticism and interpretation. Among these are a *Biblical Cyclopædia*, and an *Analytical Concordance*; also, a work on *Early Oriental History*; a *Life of Dr. Kitto*; and a *History of the English Bible*.

EADMER, *ēd'mēr*, OF CANTERBURY: lived in the beginning of the 12th c; died probably 1124, Jan. He seems, from his name, to have been the child of English parents. At an early age, he entered the Benedictine monastery of Canterbury; and when St. Anselm, 1093, was made archbishop of that see, E. became one of his most devoted friends, sharing his exile, watching his death-bed, ordering his burial, and writing the chronicle of his life. E. continued at Canterbury, in high esteem with St. Anselm's successor, Abp. Ralph, until 1120, when, at the request of King Alexander I. he went to Scotland, and

was there chosen bp. of St. Andrews. The question of lay investiture of ecclesiastical benefices was then in its crisis; there was a controversy between Canterbury and York for jurisdiction over the see of St. Andrews; that see, again, asserted its independence of either of the English metropolitans; and E. seems to have added to all these perplexities a difficulty as to his monastic allegiance. 'Not for all Scotland,' he said to the Scottish king, 'will I renounce being a monk of Canterbury.' The king, on his side, was equally unyielding; and the issue was the return of E. to his English monastery, unconsecrated, indeed, but still claiming to be bishop of St. Andrews. He was made precentor of Canterbury. He tells us that, from his childhood, he was a diligent observer of contemporary events, especially in church affairs; and this habit has given more than usual interest to his writings. The most valuable are *Historia Novorum*, or History of his Own Times, printed first by Selden 1623, and his *Vita Anselmi*, or Life of St. Anselm, published first at Antwerp 1551. Both these works are included in the selection of his writings published by the Benedictines of St. Maur (as a supplement to their edition of the works of St. Anselm), in 1 vol. fol. (Paris 1721). His lives of St. Odo, St. Dunstan, and St. Bregwyn, of Canterbury, and of St. Wilfrid and St. Oswald, of York, were printed, some of them, by Wharton, in the second part of his *Anglia Sacra* (Lond. 1691), and others by Gerberon in his *Anselmi Opera* (Paris 1675). The history of E., in relation to the bishopric of St. Andrews, is given at considerable length by Lord Hailes, in his *Annals of Scotland*, I. pp. 59-71; and, still better, in Mr. Grub's *Ecclesiastical History of Scotland*, I., pp. 209-217 (Edin. 1861).

EADS, *édz*, JAMES BUCHANAN, LL.D. 1820, May 23—1887, Mar. 8; b. Lawrenceburg, Ind.: engineer. He removed with his parents to St. Louis, Mo., 1833, became a clerk on a Mississippi river steamboat 1839, invented a diving-bell boat, and with it engaged in recovering property and raising steamboats sunk in the Mississippi and its tributaries 1842, and established the first glass works w. of the Ohio at St. Louis, 1845. In 1861, after several conferences with Pres. Lincoln and his cabinet, he formed a plan to defend the western rivers, and soon afterward built 8 iron-clad steamers in 100 days; following these, 1862, with a number of iron clad gun and mortar boats, which took part in numerous important engagements and in the capture of Mobile. During 1867-74 he was employed in building the great steel bridge across the Mississippi at St. Louis, having at the time the longest arches and deepest foundations of any similar structure in the world. In 1874 he made a proposition to congress to deepen and improve the channel at the mouth of the Mississippi river by means of jetties at a cost of \$5,250,000, guaranteeing to secure and maintain a channel of from 8 to 30 ft. depth. His plans were strongly opposed by U. S. engineers, but congress passed a bill authorizing him to attempt the improvement of the s.w. pass bar. He began the work 1875, June, secured



a depth of from 8 to 13 ft. in 9 months, of 30 ft. by 1879, July, and a minimum depth of 34 ft. by 1884, July 1. (For his plan see DIKE.) In 1887 congress passed a bill to enable him to construct a ship-railroad across the isthmus of Tehuantepec, a few weeks before his death. He received the degree LL.D. from the Univ. of Mo. 1874, and the Albert medal of the Royal Soc. of Arts 1884.

EAGER, a. *ē'gēr* [F. *aigre* and *eigre*, sharp, biting—from L. *acrem*, severe, sharp: It. *agro*, sour, severe: comp. Gael. *eigreadh*, cold]: acid or sour; severe; keen; ardently desirous; vehement; impetuous; earnest. EA'GERLY, ad. -*lī*. EA'GERNESS, n. earnestness; ardor of inclination.—SYN. of 'eager': ardent; forward; zealous; fervent; hot; sharp; keen;—of 'eagerness': ardor; vehemence; heartiness; impetuosity; avidity; greediness.

EAGLE, n. *ē'gl* [F. *aigle*—from It. and L. *aquila*, an eagle—from L. *aquilus*, dark-colored, dun]: a large bird of prey; in the *United States*, a gold coin equal to 10 dollars (see DOLLAR); in *heraldry*, emblem of might and courage; variously represented, but usually 'displayed' (q. v.). EAGLE-EYED, sharp-sighted. EAGLET, n, *ē'glēt*, a young eagle. EAGLE-RAYS, n. in *zool.*, name of the fishes belonging to the genus *Myliobatis*. EAGLE-STONE, a variety of iron ore having a concentric structure, fabled to have been hatched in the nest of the eagle. EAGLE-WOOD, a fragrant wood from tropical Asia, also called aloes-wood (q. v), the *Aquilāriū ovātā*, and *A. agāllōcha*, ord. *Aquilāriācēæ*.

EA'GLE (*Aquila*): genus of birds of prey, by some naturalists subdivided into several genera, constituting a group which contains the largest and most powerful of the *Falconidæ*. From the most ancient times, the E. has been universally regarded as the emblem of might and courage; and, like the lion, it has been fancifully invested with other attributes of greatness, such as men thought to harmonize with these. Its extraordinary powers of vision, the vast height to which it soars in the sky, the wild grandeur of the scenery amid which it loves to make its abode, and perhaps also its longevity, have concurred to recommend it to poetic regard. It was associated with Jupiter in the Roman mythology; its figure on the standards of the Roman legions expressed and animated their confidence of victory: see EAGLE (as a milit. standard).

The eagles have the beak not curved from the very base, like the true falcons, nor notched on the edge; neither are their wings so long in proportion to their size. Their wings are, however, very broad and expansive; their legs are very robust; their claws curved, sharp, and strong. In the most restricted use of the generic term, the true eagles, of which the Golden E. may be taken as type, have a rather short bill, curved from the cere, with a slight festoon on the edge of the upper mandible; the tarsi are short, and feathered down to the toes. This last character distinguishes them at once from the ernes (q. v.), often also called eagles. There are several species of true eagles well ascertained, though in this as in allied genera much confusion has



The Golden Eagle (*Aquila chrysaetos*), Adult Male.



German Eagle.



Austrian Eagle.



Ear.—Scheme of Mammalian Labyrinth: *a*, Utricle; *b*, Saccule; *c*, Aquæductus vestibuli, dividing into two branches, going to saccule and utricle respectively; *d*, Canalis or ductus reuniens.



Russian Eagle.



## EAGLE.

arisen from the diversity of plumage at different ages.—The GOLDEN E. (*A. chrysaëtos*)—of which what is called the Ring-tailed E. is the young—is about three ft. or three ft. and a half in length, and eight ft. in spread of wing. The female is rather larger than the male; the color is dark brown, in some parts almost black, the head and back of the neck in mature birds covered with pointed feathers of a golden-red color; young birds have a considerable part of the tail white. The Golden E. is the largest of European eagles, and is found not only throughout Europe, preferring wild and mountainous situations, but through almost the whole northern hemisphere; it is among the birds of India, of the north of Africa, and of N. America; and the savage warrior of the Rocky Mountains, 'as well as the Highland chieftain, glories in his eagle plume.' Although occasionally seen in all parts of Britain, it builds its nest only in mountainous districts, carrying a few sticks and brambles to the inaccessible shelf of a rocky precipice, where the eggs are deposited almost on the bare rock. The Golden E. is now rare even in the Highlands of Scotland. A great quantity of prey is necessary to support a pair of these birds and their two or three young ones; and not only hares, game of every kind, and lambs are carried to the eyrie, but larger animals are sometimes attacked, and almost every district where eagles build their nests has its story of children carried off to feed the eaglets, and often of their almost miraculous preservation.—The next in size to the Golden E. among the eagles of Europe, is the Imperial or Grecian E. (*A. imperialis*), but it is more common in Egypt than in Europe, and has never been seen in Britain.—The Spotted E. (*A. naevia*) has been found in the south of Ireland.—There is an Australian E. (*A. fuscus*).

Eagles were ranked among what were called, in the language of falconry, ignoble birds of prey, as incapable of being tamed and employed to assist in the sports of man. But either the Golden E. or the Imperial E. is used by the Tartars in the chase of antelopes, wolves, foxes, hares, etc.

The white-tailed E. or Cinereous E. of Britain is the common erne (q.v.). The White-headed E. or bald-headed E. of America—the chosen emblematic E. of the United States—is also an erne. What particular species was the emblematic E. of the ancients, is not more certain than what is the original emblematic Scotch thistle.—Others of the E. group of *Falconidae* are known as marsh eagles, harpy eagles, eagle-hawks, ospreys, etc., for some of which see their titles: see also ACCIPITRES: BIRDS.

EA'GLE, as a Military Standard: adopted by the Romans, and even by nations preceding them in history. The Persians, in the time of Cyrus the Younger, bore an eagle on a spear as a standard. The Romans for some time used the eagle, the wolf, the boar, the horse, and the minotaur for standards, but afterward abandoned the last four, and confined themselves to the eagle. The Roman eagle, some times of gold, more frequently of silver, was about as large as a pigeon with extended wings, and was

## EAGLE.

borne on the top of a spear, with a cross-bar or a shield to support it. Some of the eagles were represented as holding thunderbolts in their talons, and usually bore the name of the legion to which each respectively belonged. The eagle was sometimes made of steel, but rarely.



Roman Eagle.

In modern times France, Russia, Prussia, Austria, and the United States, all have adopted the eagle as a national military symbol. The Austrian eagle is represented double-headed.

**EAGLE, BLACK, ORDER OF THE**, in Prussia: founded by the Elector of Brandenburg 1701, Jan. 17, the day of his coronation as king of Prussia. The number of knights, in addition to the

princes of the royal family, was originally 30, but is now unlimited. They must at their nomination be at least 30 years of age. They must prove their noble descent for four generations through both parents. A chapter is held twice a year.

The insignia of the order consist of an octagonal cross of blue enamel, and a black eagle displayed between each of the arms of the cross. The cross is suspended by a broad ribbon of orange color across the left shoulder, and is accompanied by an embroidered silver star, fastened on the



Star of the Order of the Black Eagle.



Ribbon and Cross of the Order of the Black Eagle.

left breast. The centre of the star represents a black flying-eagle, holding in one claw a laurel wreath, and in the other a thunderbolt, with the legend, *Sum cuique*. Fifty ducats must be paid by every new member for



## EAGLE—EAGLE HAWK.

the support of the orphan asylum at Königsberg, and he then receives gratis the costume and insignia of the order, of which a full description is given in Burke's *Orders of Knighthood*, p. 199. As the black eagle is the highest order in Prussia, no member of it, with the exception of foreign princes and knights of St. John, is permitted to wear any other order with it; and as it is generally granted only to those who are expected to be near the person of the king, no one who holds it is permitted to travel from the court more than 20 German miles without giving notice. Knights of the Black Eagle are likewise knights of the Red Eagle (q.v.), first class.

EA'GLE, RED, ORDER OF THE, in Prussia: founded 1734 by the Markgraf George Frederick Charles, as a reorganization of the 'Ordre de la Sincérité,' which had been instituted in the beginning of the century by the hereditary prince of Anspach and Baireuth. After various modifications, the order was raised 1791 by Frederick William II. to the rank of the second order in the monarchy, and it was then that the decoration of a white enamelled Maltese cross, surmounted by a royal crown, with the Brandenburg eagle in the corner, was adopted. All the knights of the Black Eagle were received into this new order; and it was latterly decreed that only those who had been decorated with the Red Eagle, in the first instance, could be received into the Black. In 1810, the order of the Red Eagle was reorganized, and two more classes were added to it. In 1830, the second class was subdivided into two, one of which only was allowed to wear a square star.

EA'GLE HAWK (*Morphuus* or *Spizaëtus*): genus or sub-



Eagle-Hawk (*Morphuus cristatus*).

genus of *Falconidæ*, of the eagle group, but consisting of species of comparatively small size, and characterized by

## EAGLE OWL.

short wings, long slender legs (*tarsi*), and comparatively feeble toes and claws. Some of the species are extremely beautiful in form and colors. They are natives of warm climates, chiefly of S. America, but also of Africa and the E. Indies. The Crested E. (*M. cristatus*) of Guiana, and the Brazilian E., or Urubitinga (*M. Urubitinga*), are examples. The latter, though not so large as a goose, is sometimes called the Brazilian Eagle.



Eagle Owl (*Bubo maximus*).

EA'GLE OWL (*Bubo*): genus of the owl (q.v.) family (*Strigidae*), characterized by a somewhat incomplete facial disk, two tufts of feathers (*horns* or *egrets*) of considerable size on the head, ears with small openings (*conchs*), legs and toes covered with feathers, short strong curved bill, and long curved sharp claws. To this genus belong the largest nocturnal birds of prey. The E. O. of Europe (*B. maximus*) is little inferior in size to the Golden Eagle, and preys on quadrupeds such as hares, rabbits, and young deer, and on grouse, partridges, and other kinds of game. It seizes its prey with its feet, and seldom touches it with the bill till its struggles are over. It is an inhabitant of many parts of Europe and Asia, but is only a rare occasional visitor in Britain. The loud peculiar cry of this bird, resounding strangely through the night, has obtained for it its German name of *Uhu*, and an intimate association from time immemorial with evil omens and superstitious terrors.—The E. O. of America (*B. Virginianus*), the VIRGINIAN HORNED OWL or GREAT HORNED OWL, is very similar, but of inferior size, although a bold and powerful bird. It carries off with ease almost any inhabitant of the poultry-yard. It is found in almost all parts of America.



## EAGRE-EANING.

**EAGRE**, or **EGRE**, n. *ē'gēr*; also spelled **HYGRE** or **HIGRE**, n. *hī'gēr* [AS. *egor*, the sea, water: Icel. *ægir*, the god of the sea, the sea itself (see **HIGRE**)]: the English name applied to the tidal bore; a hollow and harsh roar caused in certain rivers by the rapid and violent advance of a spring-tide against the current of a river: see **BORE** 3.

**EALING**, *ē'ling*: village and parish in Middlesex, England, close to Brentford. Pop. of parish (1891) 23,978.

**EAMES**, *ēmz*, **CHARLES**: 1812, Mar. 20—1867, Mar. 16; b. New Braintree, Mass.: lawyer. He graduated at Harvard Univ. 1831, studied law in the Cambridge law school, and was admitted to the bar, but ill health prevented him from practicing. He received an appointment under the navy dept. 1845, became an editor of the *Washington Union*, was appointed by Pres. Polk a commissioner to negotiate a treaty with the Sandwich Islands, and on his return, 1851 edited the *Nashville Union* some time and then returned to the *Washington Union*. Pres. Pierce appointed him U. S. minister to Venezuela, where he remained till 1850, when he resigned. He again settled in Washington, began practicing his profession, and attained high rank as an admiralty lawyer. He was an accomplished scholar and linguist.

**EAMES**, *ēmz*, **EMMA**: soprano singer: 1868— —————; b. in China, during a temporary residence there of her parents, from Boston, Mass. She first studied singing in Boston, and went to Paris (1883) and studied under Mme. Marchesi. Gounod also taught her, and she made her *début* (1889) in his *Roméo et Juliette*, in Paris. In 1891, she married Julian Story.

**EANING**, n. *ēn'īng* [AS. *eanian*, to bring forth as a ewe; *ge-ean*, to yean: W. *oen*; Gael. *uan*; Manx, *ea yn*, a lamb]. in *OE.*, the time when lambs were born. **EANLINGS**, n plu. *ēn'īngs*, the lambs when born.

## EAR.

**EAR**, n. *ēr* [AS. *eare*, the ear: Icel. *eyra*; L. *auris*; Goth. *auso*; Ger. *ohr*, an ear]: the organ of hearing; the power or faculty of readily distinguishing musical sounds; in *music*, figurative for a sensitive, just, and delicate appreciation of sound and measure; attention; heed; regard; one of the projecting parts of a vessel used as handles; in *organ-building*, *ears* are small projecting pieces of metal on the sides of the mouths of metal pipes for assisting the pipes to speak promptly, especially when the organ is of small scale: the German term is 'beard.' **EARED**, a. *ērd*, having ears; in *her.*, epithet applied to animals borne in coat-armor, having the ears of a different tincture from that of the rest of the body; in *bot.*, auriculate; having two small rounded lobes at the base, as the leaf of *Salvia officinalis*; having developed into ear, having the inflorescence fully formed; in *agri.*, a term applied at the stage when the leaf and ear differ in color. **EARING**, n. in *naut.*, the ropes which lash the upper corner of a sail to its yard. The reef-earings are used to lash the ends of the reef-band to the yard. **EARLAP**, n. the tip of the ear. **EAR'LESS**, a. without ears. **EAR-MARK**, n. in *law*, any mark made upon anything for the purpose of identification. **EAR-PIERCING**, very shrill. **EAR-ACHE**, *-āk*, pain in the ear. **EAR-BONES**, three small bones connected with the organs of hearing. **EAR-DRUM**, the membrane stretched across the internal ear, like the parchment of a drum; the tympanum. **EAR-RING**, a drop or pendant on the ear as an ornament. **EAR-SHOT**, n. hearing distance. **EAR-SPECULUM**, n. in *surg.*, instrument for distending the external canal of the ear, in removing indurated wax, or in other explorations and operations; an otoscope. **EAR-TRUMPET**, an instrument to enable the somewhat deaf to hear more distinctly. **EAR-WAX**, the thick brownish substance which gathers inside the ear. **WITHIN EAR SHOT**, within reach of the hearing. **EARWIG**, n. [AS. *wigga*, a creeping thing]: an insect having a forked tail, supposed, but ignorantly, to enter the ear: V. to get into a person's confidence or good graces by telling tales of others. **EAR'WIGGING**, imp.: N. the gaining of confidence and good graces by whispered and covert statements about others. **EAR'WIGGED**, pp. *-wigd*. **EAR-WITNESS**, one who can testify from his own hearing; one who hears a thing. **EAR OF DIONYSIUS**, n. *dī-o-nīsh'ī-us*, an acoustic instrument named after the sound-conducting orifice in the roof of the dungeons where the old Sicilian tyrant kept his prisoners. It has a large mouth-piece to collect the sound, which a flexible tube conducts to the ear of the person. It is especially adapted for enabling the very deaf to hear general conversation, lectures, sermons, etc. **TO SET BY THE EARS**, to make strife; to cause to quarrel. **ABOUT YOUR EARS**, beset or attacked, as for revenge. **OVER HEAD AND EARS**, or **UP TO THE EARS**, in an extreme degree. **A FLEA IN YOUR EAR**, a cuff or box on the ear; a rebuff; some sharp and disagreeable words.

**EAR**, n. *ēr* [AS. *ēdr* or *æchir*; Goth. *ahs*; Ger. *ahre*; Dut. *ære*, an ear of corn]: the head or top part of corn con-



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tainig seeds: V. to form ears, as corn. EAR'ING, imp. EARED, pp. *ērd*: ADJ. having ears.

EAR, v. *ēr* [AS. *erian* and *earian*; Gael. *ar*; Icel. *erja*; Dut. *eren*; L. *arārē*, to plow: Gr. *arōō*, I plow]: in *OE.*, to plow; to cultivate. EARING, imp, *ēr'ing*: N. the plowing of fields. EARED, pp. *-ērd*, plowed; tilled—see Gen. xlv. 6; Ex. xxxiv. 21; frequently occurring in Shakespeare. EARABLE, a. *ēr'ā-bl*, capable of being plowed.

EAR, ANATOMY AND PHYSIOLOGY OF THE: structure and functions of the apparatus of hearing, in man and the mammalia. The apparatus is composed of three parts—the external ear, the middle ear or tympanum, and the internal ear or labyrinth.

The *external ear* consists of two portions, the *auricle* or *pinna* (the part popularly recognized as the ear), and the *auditory canal* or *external meatus*.

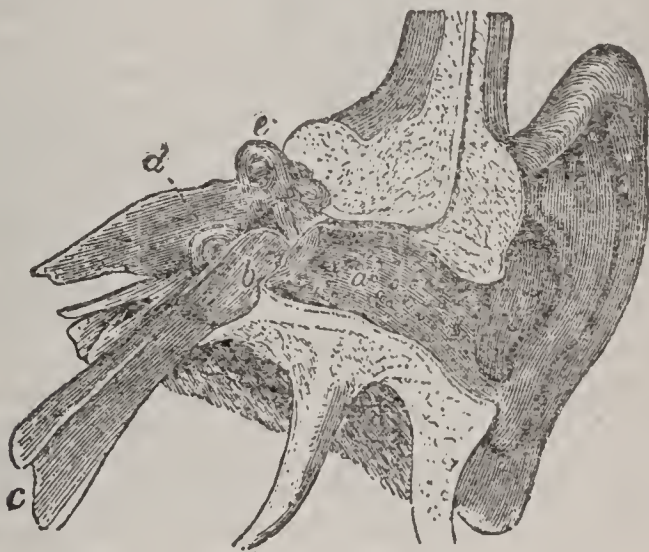


Fig. 1.

General view of the external, middle, and internal ear, showing the interior of the auditory canal, tympanic cavity, and Eustachian tube.

*a*, the auditory canal; *b*, the tympanum; *c*, the Eustachian tube, leading to the pharynx; *d*, the cochlea; and *e*, the semicircular canals and vestibule, seen on their exterior by the removal of the surrounding bony tissue.

The auricle, on its outer or more exposed surface, presents various eminences and depressions, resulting from the form of its cartilaginous framework. These have received special anatomical names, to which it is unnecessary to advert further than to mention that the deep capacious central space to which several grooves converge, is termed the *concha*, and that the lowest and pendulous portion of the ear is termed the *lobe*. The cartilage forming the basis of the external ear consists of one principal piece, in which there are several fissures, which are filled up by fibrous membrane. Several muscles are described as passing from one part of the auricle to another, but they are so little developed in man that they do not require notice;

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there are additionally three muscles—the *attollens aurem* (or *superior auris*), the *attrahens aurem* (or *anterior auris*), and the *retrahens aurem* (or *posterior auris*), which pass from adjacent parts of the scalp to the ear, and which, though more developed than the previous group, are of little or no real importance in man (at least in his civilized state), but are of considerable use in many mammals. Their actions are sufficiently indicated by their names.

The auditory canal passes from the concha inward, and a little forward, rather more than an inch. It is narrower at the middle than at either extremity; and on this account there is often considerable difficulty in extracting foreign bodies that have been inserted into it. The membrane of the tympanum which terminates it is placed obliquely, in consequence of the lower surface of the meatus being longer than the upper. The canal is partly cartilaginous and partly osseous; the osseous portion consisting, in the fœtus, of a ring of bone, across which the membrane is stretched, and in many animals remaining persistently as a separate bone. The orifice of the meatus is concealed by a pointed process, which projects from the facial direction over it like a valve, and which is called the *tragus*, probably from being sometimes covered with bristly hair like that of a goat (*tragos*); and it is further defended by an abundance of ceruminous glands, which furnish an adhesive, yellow, and bitter secretion (see CERUMEN), which entangles small insects, particles of dust, and other small foreign bodies, and prevents their further passage into the meatus.

The *middle ear*, or *cavity of the tympanum*, is a space filled with air received from the pharynx (q.v.) through the Eustachian tube (see fig. 1, *b*, *c*), and traversed by a chain of very small movable bones (fig. 2), which connect the membrane of the tympanum with the internal ear. It lies, as its name implies, between the external meatus and the labyrinth or internal ear, and opens posteriorly into the cells contained in the mastoid portion of the temporal bone, which also are filled with air, and anteriorly into the Eustachian tube. The cavity is of irregular shape, and is lined by a very delicate ciliated epithelium, a prolongation of that of the pharynx through the Eustachian tube.

Its external wall is mainly formed by the membrane of the tympanum, which is nearly oval, and placed in a direction slanting inward to form an angle of about  $45^{\circ}$  with the floor of the auditory canal (see fig. 1). The handle of the malleus (or hammer), the first of the chain of ossicles (see fig. 2), is firmly attached to the inner side of this membrane in a vertical direction as far downward as the centre, and by drawing it inward, renders its external surface concave.

Its internal wall has two openings communicating with the internal ear, each of which is closed by a delicate membrane. These openings are termed, from their respective shapes, the *fenestra ovalis*, and the *fenestra rotunda*; the former leads to the vestibule, and is connected by its membrane with the base of the stapes (or stirrup-bone), the last of the chain of ossicles; while the latter opens into the cochlea.



The ossicles of the tympanum are three—viz., the *malleus*, the *incus* (or anvil), and the *stapes*. It was observed above that the malleus is connected with the membrane of the tympanum by its handle. Through this connection, the tension of that membrane may be modified by the agency of one or two muscles which are attached to this ossicle. These muscles are the *Laxator tympani*, which arises from the spinous process of the sphenoid bone (q.v.), and is inserted into the processus gracilis; and the *Tensor tympani*, which arises from the under surface of the petrous portion of the temporal bone, and is inserted into the handle of the malleus immediately below the commencement of the *processus gracilis*. The existence of the former of these muscles is doubtful, many anatomists regarding the structure in

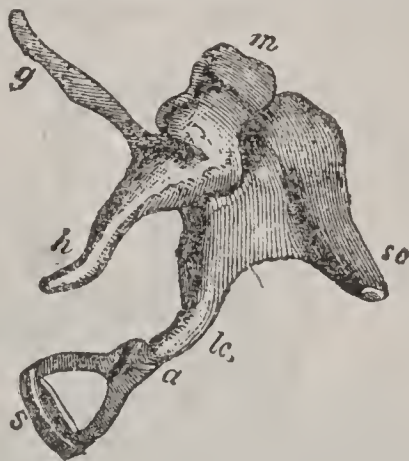


Fig. 2.

Ossicles of the left ear, as seen from the outside and below.

*m*, head of the malleus; *g*, the slender process, or *processus gracilis*; *h*, the manubrium or handle; *sc*, the short crus, and *lc* the long crus of the incus; *a*, the position of the lenticular process, through the medium of which it articulates with the head of the stapes; *s*, the base of the stapes. Magnified three diameters.

question as ligamentous rather than muscular. The mode in which this bone articulates with the incus is sufficiently explained by the figure. The *incus* much more closely resembles a molar tooth with two fangs, than the anvil from which it derives its name. Of the two processes which it gives off (see fig. 2), the short one, *sc*, runs backward, and projects into the mastoid cells behind the tympanic cavity; while the long one, *lc*, inclines downward, and terminates in the lenticular or orbicular process, *a*, to which the head of the stapes is attached. The *stapes* has a head, neck, two branches, and a base, which, as has been already mentioned, fits into the fenestra ovalis. A minute muscle, the *stapedius*, takes its origin from a hollow conical eminence termed the *pyramid*, behind the *fenestra ovalis*, and is inserted into the neck of the stapes; by pulling the neck backward, it probably compresses the contents of the vestibule.

The Eustachian tube, into which the tympanic cavity opens anteriorly, is about an inch and a half in length, and passes downward, forward, and inward, to its opening

## EAR.

in the pharynx. It is partly bony, but chiefly cartilaginous. Its use is to allow the free passage of air in and out of the tympanum, and to admit of the egress of the mucus secreted in that cavity.

The *internal ear* or *labyrinth* is the essential part of the organ of hearing, being the portion to which the ultimate filaments of the auditory nerve (q.v.) are distributed. It is composed of three parts—viz., the *vestibule*, the *semi-circular canals*, and the *cochlea*, which form a series of cavities presenting a very complicated arrangement, and lying imbedded in the hardest part of the petrous portion of the temporal bone. They communicate externally with the tympanum by the two openings already described—the *fenestra ovalis*, and the *fenestra rotunda*; and internally with the internal auditory canal, which conveys the auditory



Fig. 3.

### Interior of the Osseous Labyrinth:

V, vestibule; ar, aqueduct of the vestibule; o, fovea semi-elliptica; r, fovea hemispherica; S, semicircular canals; s, superior; p, posterior; i, inferior; a, a, a, the ampullar extremity of each; C, the cochlea; sv, osseous zone of the lamina spiralis, above which is the scala vestibuli, communicating with the vestibule; st, scala tympani, below the spiral lamina. Magnified  $3\frac{1}{2}$  diameters.

nerve from the cranial cavity to the internal ear. The very dense bone immediately bounding these cavities is termed the *osseous labyrinth*, to distinguish it from the *membranous labyrinth*, which lies within a portion of it.

The *vestibule* is a common central cavity into which the semicircular canals and the cochlea open (see fig. 3, V). It is about a fifth of an inch in height, and in length from front backward, its transverse diameter (from side to side) being somewhat less. On its posterior wall are five orifices for the semicircular canals, one of the orifices being common to two of the canals. Anteriorly, the cochlea enters it by a single opening, the beginning of the *scala vestibuli*. On its outer wall is the *fenestra ovalis*, and on its inner are the



*fovea hemispherica*, containing several minute orifices for the entrance of filaments of the auditory nerve, and the *fovea semi-elliptica*.

The *semicircular canals* are three in number, and open at both ends into the vestibule. They vary in length, and notwithstanding their name, each is considerably more than a semicircle, the superior vertical canal being the longest. Their average diameter is about a twentieth of an inch, the extremity of each canal having a dilatation or *ampulla*. Each canal lies in a different plane, very nearly at right angles to the planes of the other two, hence their names of the *superior vertical*, the *inferior vertical*, and the *horizontal* canals.

The *cochlea*, which derives its name from its resemblance to a common snail-shell, forms the anterior portion of the

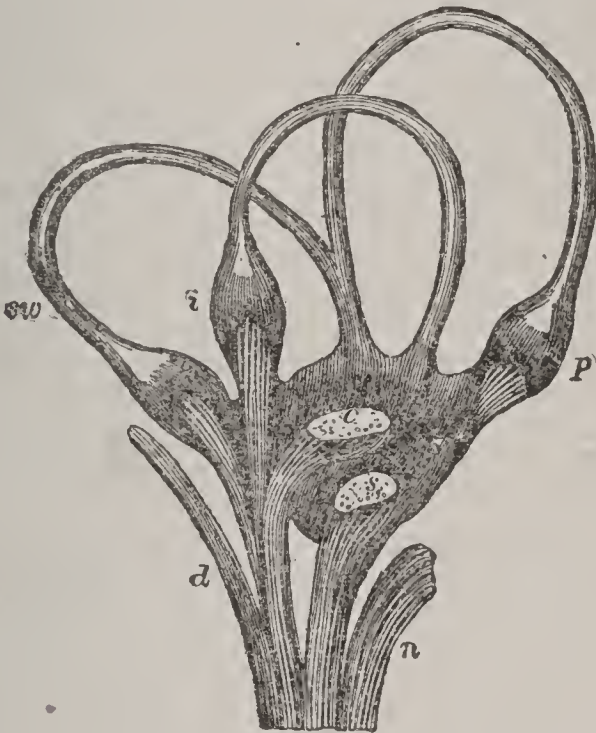


Fig. 4.

Membranous Labyrinth of the Left Side, with its Nerves and Otoliths.

*sw*, superior semicircular canal, with the ampulla and its nerve at one end, and the other end joined by *p*, the posterior canal, to form a common tube; *i*, inferior or horizontal canal, with the ampulla and its nerve at one end, and the other entering the utricle separately; *c*, powdery otolith seen through the transparent wall of the utricle or common sinus; *s*, powdery otolith of the sacculus, seen with its nerve in a similar way; *n*, cochlear division of the auditory nerve, cut through; *d*, *portio dura*, or facial nerve, leaving the auditory nerve, or *portio mollis*, to enter the aqueduct of Fallopius. Magnified.

labyrinth. It consists of an osseous and gradually tapering canal, about an inch and a half in length, which makes two turns and a half spirally around a central axis, termed the *modiolus* which is perforated at its base for the entrance of the filaments of the cochlear portion of the auditory nerve. This spiral canal gradually diminishes toward the apex of the cochlea. At its base, it presents two openings,

one into the vestibule, and the other (closed by a membrane, and communicating with the tympanum) being the *fenestra rotunda* already described. Its interior is subdivided into two passages (*scalæ*) by an osseo-membranous lamina. This is the *lamina spiralis*, which divides the cochlea into an upper passage, the *scala vestibuli*, and a lower, the *scala tympani*. At the apex, these two passages communicate by an opening to which the term *helicotrema* has been applied. Between the two *scalæ*, there is a third space termed the *ductus cochlearis*, or *scala intermedia*. In this space the filaments of the auditory nerve terminate, by being connected with a complicated arrangement of peculiarly formed epithelial cells, constituting the organ of Corbi. For a notice of the membranous portion of the *lamina spiralis*, see AUDITORY NERVE.

We now return to the *membranous labyrinth*. The membranous and osseous labyrinths have the same shape, but the former is considerably smaller than the latter, a fluid, termed the *perilymph*, intervening in some quantity between them. At certain points, recent investigations have shown that the membranous is firmly adherent to the inner surface of the osseous labyrinth. The vestibular portion consists of two sacs, an upper and larger one, of an oval shape, termed the *utricle*, or *common sinus*, and a lower and smaller one of a more globular shape, called the *sacculus*.

The membranous semicircular canals resemble in form and arrangement the osseous canals which inclose them, but are only one-third of the diameter of the latter. The ultimate filaments of the auditory nerve (q.v.) mainly go (see fig. 4) to the utricle, to the sacculus, and to the ampulla of the canals.

The membranous labyrinth is filled by a fluid termed the *endolymph*; and in certain spots, especially at the terminations of the vestibular nerves, both in man in the lower animals, calcareous matter either in a powdered or solid form is found. In man and mammals generally, and in birds and reptiles, it occurs as a powder, and is termed *otoconia* or *ear-powder*, and it always consists of carbonate of lime.

We now proceed to the different functions or offices of the various parts of the organ of hearing.

1. *Of the External Ear*.—A true auricle exists only in the mammalia, and in this class it varies from little more than an irregularly shaped cartilaginous disk, with little or no motion, as in man and the quadrumana, to an elongated funnel-shaped ear-trumpet, movable in all directions by numerous large muscles, as in the horse, the ass, and the bat.

The mode in which we see it employed by those animals in which it is highly developed, sufficiently indicates that its main function is to collect and concentrate the sounds which fall upon it. But the experimental investigations of Savart, with an apparatus constructed to resemble the tympanic membrane and the external auditory apparatus, show that these parts are adapted also to enter into vibrations in unison with those of the air; and he suggested that the human auricle, by the various directions of different



parts of its surface, could always present to the air a certain number of parts whose direction is at right angles with that of the molecular movement of that fluid, and therefore in the most favorable position for entering into vibrations with it.

2. *Of the Tympanum and its Contents.*—Savart's experiments show that the membrane of the tympanum is thrown into vibration by the air, and that it always executes vibrations equal in number to those of the sonorous body which excites the oscillations in the air. He further ascertained that the malleus participates in the oscillations of the tympanic membrane, and that these vibrations are propagated to the incus and stapes, and thus to the membrane of the fenestra ovalis. The malleus has further the office of regulating, through the *tensor tympani* muscle, the tension of the tympanic membrane; and to allow of the motion necessary for this purpose, we find movable joints between it and the incus, and again between the latter bone and the stapes. The contraction of the stapedius muscle similarly modifies the tension of the membrane of the *fenestra ovalis*; and as compression exercised on this membrane extends to the perilymph, and is propagated through it to the *fenestra rotunda*, the tension of the membrane of the latter opening is also influenced by the muscle in question. The incus is much more limited in its motions than either of the other bones, and its use seems to be to complete the chain of ossicles in such a manner as to prevent any sudden or violent tension of the membranes, such as we can easily conceive might occur, if the conductor between the membranes were a single bone. The presence of air in the tympanic cavity serves a double purpose: in the first place, it preserves a uniform temperature on the outer surfaces of the fenestral membranes, and thus supports a fixed elasticity in them, which would not be the case if they were freely exposed to ordinary atmospheric changes; and secondly, the action of the chain of ossicles as conductors of sound is materially increased by their being completely surrounded by air, as is obvious from the first principles of acoustics.

3. *Of the Labyrinth.*—Sound is conducted to the labyrinth in three ways: first, by the chain of bones; secondly, by the air in the tympanic cavity; and thirdly, through the bones of the head.

Müller has shown, by very ingenious experiments on an apparatus constructed to resemble, on a large scale, the middle and internal ear, that while the air in the tympanum conducts sound to the cochlea, through the *fenestra rotunda*, the chain of bones forms a much better conductor of it to the vestibule, through the *fenestra ovalis* (see the chapter on Hearing in his *Physiology*). Hence, we infer that the vestibule is adapted to receive sounds from the membrane of the tympanum and the external ear, while the cochlea, on the other hand, as its structure and connections indicate, may be regarded as that part of the labyrinth which is specially affected by sounds communicated through the bones of the head.

That the vestibule is the essential or fundamental part of

the organ of hearing, is sufficiently proved by its constancy, other parts gradually disappearing as we descend the animal scale, and by its central position in the ears of the higher animals. The use of the otoconia or ear-powder is to strengthen the sonorous undulations, and to communicate to the membranous vestibule and ampullæ, and to their nerves, stronger impulses than the perilymph alone could impart. The action of otoliths or ear-stones, such as occur in osseous fishes, must be still more decided, and is well illustrated by the following experiment of Camper. Fill a bladder with water, and place a pebble in it. The slightest impulse communicated to the bladder disturbs the pebble, which consequently produces a greater impression on the hand supporting the bladder than the water alone could do.

Nothing certain is known regarding the functions of the semicircular canals, but their constant existence and number in the vertebrated animals indicate their importance; and in most cases of congenital deafness they are more or less defective. Perhaps among vertebrates the only exceptions to their constant presence are the mýxine or hag (with only one semicircular canal), and the lamprey (with only two)—both, fishes of very low organization. The correspondence of the position of these canals with the three dimensions of a cube—its length, breadth, and height—has led to the opinion that they are concerned in conveying a knowledge of the direction of sounds. This view is supported by Prof. Wheatstone, who believes that we distinguish best the direction of those sounds which are sufficiently intense to affect the bones of the head, and that it is from the vibrations transmitted through these bones that our perception of direction is obtained. In recent vivisections, cutting one or more of the semi-circular canals results in staggering dizziness, or loss of the sense of level, which is part of the sense of direction. It is thought that movement of lymph in this or that canal according to movement or position of the head, may affect the sense of level, and explain a loss of it when the canals are cut. As to the rods of Corti, like a series of rafters of varying length, the apex at *d* (Fig. 2, Plate 5), and which have been compared to harp-strings, the only hypothesis is that certain lengths respond to pitch of sound.

The range of hearing, like that of vision, varies remarkably. The ordinary range of human hearing comprised between the lowest notes of the organ and the highest sound of insects, includes, according to Wollaston, more than nine octaves, all of which are distinctly perceptible by most ears. He relates, however, several cases in which the range, in reference to the perception of high notes, was much less. In one individual, the sense of hearing terminated at a note four octaves above the middle E of the pianoforte, the F above it being inaudible, though his hearing in other respects was as perfect as that of persons in general; another case was that of a lady who could never hear the chirping of the field-cricket; and in a third case the chirping of the common house-sparrow could not be heard. See his Memoir on Sounds Inaudible by Certain Ears, *Phil. Trans.* 1820.

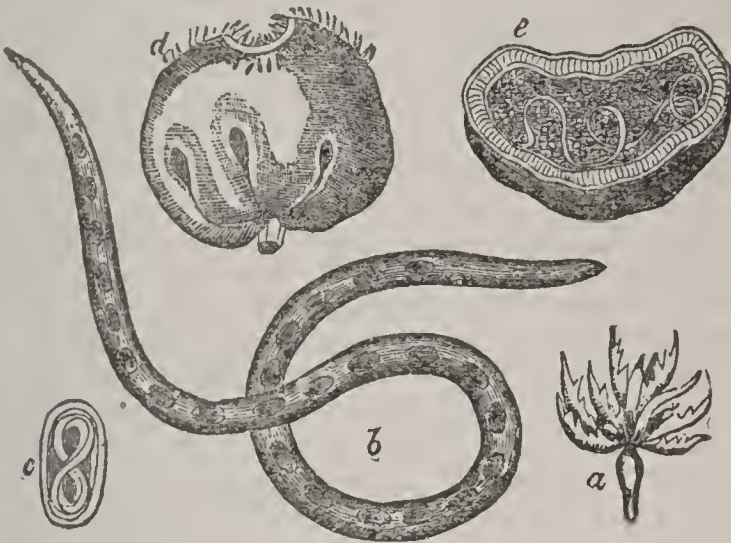


## EAR-COCKLES—EARL.

The sensation of sound, like that of light, frequently lasts longer than the exciting cause. We have familiar proof of this fact in the noise which remains in the ears after a long journey in a coach or railway; and it was clearly demonstrated by Savart, who found, in his experiments on toothed wheels, that the removal of one tooth did not produce any interruption of the sound.

For diseases of the ear, see DEAFNESS.

**EAR-COCKLES**, *ēr-kōk'lz* (called also *Purples* and *Peppercorn*): disease in wheat, owing to the presence of *Anguillula tritici*, till of late known as *Vibrio tritici*. This is a small nematoid worm (see NEMATOIDEA: EELS, in Paste), yellowish-white, slender, and tapering toward the tail. Its minute eggs are supposed to be introduced into the sap of the wheat from infected seed, and so to find their way to the flowers, where they are hatched in the germen; the infected grains become dark green, then black, rounded like



Ear-Cockles:

diseased wheat; *b*, the vibrio, greatly magnified; *c*, its egg, with embryo; *d*, diseased germen of wheat; *e*, section of diseased germen of wheat, greatly magnified, showing vibrios and their eggs.

small pepper-corns, and furrowed on the surface; the glumes spread open, and the awns become twisted; the grains are filled with a white cottony substance, which at once dissolves in water, liberating the *Vibrio* in great numbers. Henslow calculates that 50,000 of the young *Vibrio* might exist in a grain of wheat. If the wheat is dried, the *Vibrio* becomes dormant, but retains its vitality in this state for six or seven years, and is ready to revive on the application of moisture.

**EARL**, *n. ērl* [Icel. *iarl*, a prince, a viceroy: AS. *eorl*, a chief, a leader, a warrior]: in *Great Britain*, a nobleman third in rank, being above a viscount and below a marquis. **EARL'DOM**, *n. -dūm*, the possessions or dignity of an earl. *Note*.—It is curious that the word *earl*, so generally supposed pure Icelandic, should be found also in W. *arglwydd*; and Cornish, *arluth*, a lord: Gael. *iarfhlath*, pronounced *iarla*, a dependent chief—from *iar*. after; *flath*, lord.—The dis-

## EARL.

tinctive name of the noble among the northern races was *eorl*, or *jarl*, as opposed to the mere freeman, the *ceorl*, or *karl*; from which latter name come the modern German word *kerl*, and the Scotch word *carl*. From indicating the whole noble class, the title of *eorl* among the Anglo-Saxons, and perhaps generally among the Teutonic nations, came at first probably to be limited to those who were *ealdors*, or *caldormen*, by office—that is to say, to those who were appointed to be at once governors and judges over a certain district, and to whom, according to Kemble (*Saxons in England*, II. 126), the titles of *dux*, *princeps*, and *comes* are indiscriminately applied by the Latin writers, the same officer being called sometimes by one title, and sometimes by the others. Being thus limited to those who held the office of *ealdors*, the social not unnaturally came to be confounded with the official title, and hence the general error of tracing the word *earl* not to *eorl*, a noble, but to *ealdorman*, a title which Mr. Kemble prefers to translate by duke. The early relation between the duke and the count has been explained under the former title. In Europe generally, it was not till the count came to be recognized as a subordinate officer to the duke, governing a district of the province committed to the latter, that the *earl* assumed the position of the governor of a county, by the name of which he was commonly known. The title of duke, if it had existed, early disappeared in England, and was not revived till the time of Edward III. After the Norman Conquest, the French term *count* was substituted for *earl*; but it held its place only a very short time as the title of the officer, though it has continued ever since to give a name to the district (county) over which he presided, and a title to his wife. William the Conqueror, after the battle of Hastings, recompensed his chief captains by granting to them the lands and offices of the Saxon nobles; but by making the title of *earl* hereditary, he took, unintentionally perhaps, the first step toward changing it from a title of office to a title of dignity, and thus depriving it of substantial power. Deputies, *vice-comites*, or sheriffs, came necessarily to be appointed in all cases in which the *earl* was a minor, or otherwise incapacitated from discharging the duties of the office, till gradually the office itself passed to the deputy; the dignity alone, with the hereditary privilege of sitting as a legislator in the house of lords, remaining with the principal. The form of creation of an *earl* formerly was by the king girding on his sword, and placing his coronet on his head, and his mantle on his shoulders; but *earls* are now created by letters-patent; and it is not unusual for them to depart so far from the old notion of their being territorial officers, as to take as their titles their own names, with the prefix *earl*—e.g., *Earl Grey*, *Earl Spencer*, *Earl Russell*, etc. At present, the number of *earls* in Britain, including the peerages of Scotland and Ireland, exceeds 200. See **PEER**.



Earl's Coronet.

The **EARL'S CORONET** is a circle of gold, rising at intervals into eight pyramidal points, or spikes, on



## EARL-MARSHAL—EARLY.

the tops of which are placed as many pearls, and which alternate with strawberry-leaves: see Crown.

**EARL MAR'SHAL:** office in England, of great antiquity, and formerly of importance. There is reason to believe that the marshal of England, afterward the E. M., was a distinct officer from the marshal of the king's house, but the point is not altogether clear, and there is, consequently, some difficulty in determining which of the offices was held by the Mareschals, Earls of Pembroke. For many generations, the office has been hereditary in the family of the Dukes of Norfolk, though the earls marshal having, to an unusual extent, had the fate to die either childless or without heirs-male, the line of descent has not been direct. The last grant is by King Charles II., and bears date 1762, Oct. 19. The E. M. presided jointly with the constable over the court of chivalry (q.v.), the last proceedings of which are said to have taken place 1631. He is the head of the college of arms (q.v.), which has jurisdiction in descents and pedigrees; determines all rival claims to arms; and he grants armorial-bearings, through the medium of the kings-of-arms, to parties not possessed of hereditary arms. The office of the lyon in Scotland is generally supposed to correspond to that of the E. M. in England, but not quite correctly. The lyon having been subordinate to the marshal and constable of Scotland, his office was more nearly that of the kings-of-arms in England; with this difference, that it extended to the whole kingdom.

**EARLOM**, *ér'om*, **RICHARD**: d. 1822: English engraver, whose works in mezzotinto, published during the end of last and beginning of this c., are among the best of the period before that kind of engraving was practiced with the admixture of etching. His works after Reynolds, his plates from pictures in the Houghton Gallery and the *Liber Veritatis*, consisting of imitations of the celebrated drawings by Claude, in the possession of the Duke of Devonshire, are standard in their various departments.

**EARL'S PENNY:** English corruption for Arles Penny: see **EARNEST**.

**EARLSTON**, *ér'ston*, or **ERCILDOUNE**, *ér'sil-dón*: village in the s.w. of Berwickshire, Scotland, on the Leader, a n. branch of the Tweed, 30 m. w.s.w. of Berwick. E. has been and still is famed for its manufacture of gingham; it has also a factory for the manufacture of blankets, tweeds, etc. On the left bank of the Leader are the ruins of a building called 'Rhymer's Tower,' as having been the residence of Thomas the Rhymour (q.v.), famous in Scottish tradition. A mile s. of E. is Cowdenknowes, celebrated in song for its 'bonny, bonny broom.' Pop. of E. (1881) 1,010; (1891) 1,060.

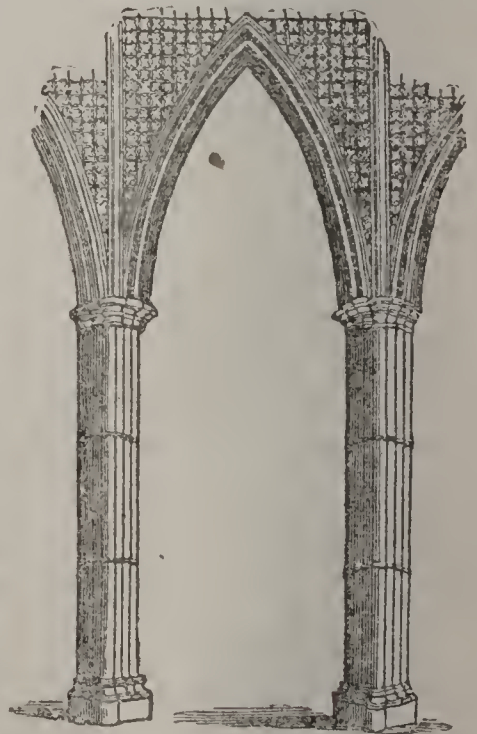
**EARLY**, a. *ér'li* [AS. *ær*, before; *ærlice*, early; Icel. *áthr*, before: comp. Gael. *ear*, east]: prior in season or time; coming soon; forward; before or in advance of others: AS. soon; betimes. **EARLIER**, a. *ér'li-ér*, more early. **EAR'LIEST**, a. *-li-ést*, most early. **EAR'LINESS**, n. the state of being early. **EARLY-ENGLISH**, n. in *philol.*, an

## EARLY—EARLY ENGLISH.

epithet most properly employed to designate the period 1250–1350, but commonly used to express any period between A.D. 1250 and the close of the 15th c.

**EARLY**, *erl'i*, JUBAL ANDERSON: 1816, Nov. 3—1894, Mar. 2; b. Franklin co., Va.: soldier. He graduated at the U. S. Milit. Acad. 1837, entered the army as a lieut. of artil., served through the Seminole war in Fla., 1837–8; resigned in the latter year, and studied and practiced law in Va. He was a maj. of Va. vols. during the Mexican war. At the opening of the civil war he was appointed a col. in the Confederate army; commanded a brigade at Bull Run and Williamsburg 1862; was promoted brig.gen. 1863; commanded a division at Fredericksburg and Gettysburg, and an army that invaded Md. and threatened Washington, 1864, July; sent a body of cavalry into Penn. which burned Chambersburg; was defeated by Gen. Sheridan near Winchester and at Fisher's Hill, Va., 1864, Sep., and at Cedar Creek Oct. 19; and was completely routed by Gen. Custer at Waynesboro, 1865, Mar., after which he was relieved of his command. He subsequently practiced law in Richmond and engaged with Gen. Beauregard in the management of a lottery in New Orleans. He became pres. of the Southern Hist. Soc., and published *A Memoir of the Last Year of the War for Independence in the Confederate States* (1867).

**EARLY ENGLISH**: general term for the form of Gothic in which the pointed arch was employed first in Britain. The E. E. succeeded the Norman toward the end of the 12th c., and merged into the Decorated (q.v.) at the end of the 13th. Its characteristics are beautiful and peculiar. Retaining much of the strength and solidity of the earlier style, it exhibited the graceful forms, without the redundancy of ornament which latterly degenerated into a fault in that which followed. Generally, it may be said to bear to the decorated something like the relation which an expanding rosebud bears to a full blown rose. The windows are long and narrow, and when gathered in a group, are frequently surmounted by a large arch, which springs from the extreme molding of the window on each side. The space between this arch and the tops of the windows is often pierced with circles, or with trefoils or quatrefoils, which constituted the earliest form of tracery. Each window, however, is generally destitute of any tracery in itself. 'The moldings,' says Parker,



Early English Piers and Arch.



## EARN—EARNEST.

'in general consist of alternate rounds and deeply-cut hollows, with a small admixture of fillets, producing a strong effect of light and shadow.'—*Gloss. of Architecture*. From the same work we borrow the accompanying illustration of two very beautiful piers, surmounted by a lancet-shaped arch, and decorated in the manner peculiar to the style. They are from Westminster Abbey. Circular windows, however, still continued to be used, and trifoliated archways over doors, also are found, as at Salisbury Cathedral. By far the most characteristic feature of the style is the Tooth-ornament (q.v.), which is often used in great profusion. Where foliage is used, it is cut with great boldness, so as to throw deep shadows, and produce a very fine effect. The under-cutting is often so deep as to leave nothing to connect the leaves with the moldings but the stalks, and occasionally the edge or point of a leaf. The term Early English is said, by Parker, to have been introduced by Mr. Millers 1805. It corresponds to *Ogivale primitive* of French writers, and in Britain is often known as the first pointed or lancet-arched. See GOTHIC ARCHITECTURE.

EARN, v. *érn* [Dut. *arne*, harvest; *arnen*, to reap: Ger. *ernste*, harvest: Bav. *arnen*, to receive as a reward of labor: comp. Gael. *aran*, bread—from *ar*, to plow]: to gain or win by labor; to reap the fruit of one's labor; to merit or deserve. EARN'ING, imp. EARNED, pp. *érnd*. EARNINGS, n. plu. *érn'ingz*, that which is earned; wages; reward.—SYN. of 'earn': to acquire; obtain; gain; win; procure; attain.

EARN, n. *érn*: an eagle.

EARN, *érn*: river and loch in the s. of Perthshire, in the finely-wooded, beautiful valley of Strathearn, Scotland.—Loch E. lies n. of Ben Voirlich; its e. extremity is 24 m. w. of Perth. It is 7 m. long from e. to w., 1 m. broad, and 100 fathoms deep, and is surrounded by bold and rugged hills.—The river E. flows e. from the loch 40 m. through the strath, past Comrie, Cricff, and Bridge of Earn, into the estuary of the Tay, 7 m. s.e. of Perth. Along the river, near Abernethy, under a thick bed of clay, is a peat-bed 2 or 3 ft. thick, supposed continuation of the submarine forest at Flisk.—The Bridge of Earn, a much frequented village, stands on the right bank of the river, 6 m. s.s.w. of Perth, and near the saline springs of Pitcaithly.

EARNEST, a. *érn'èst* [Ger. *ernst*; Dut *ernsten*, to endeavor: AS. *georn*, desirous]: done with a will; with hearty endeavor to attain the end aimed at, eager to obtain; zealous; sincere; serious. EARN'ESTLY, ad. *-lī*. EARN'ESTNESS, n. seriousness; solicitude; not a feigned appearance. IN EARNEST, not in jest; really intent on.—SYN. of 'earnest': ardent; eager; warm; importunate; animated; hearty; fervent.

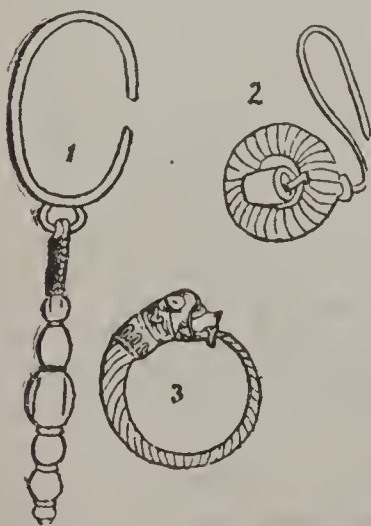
EARNEST, n. *érn'èst* [OF. *arres* or *ernes*; W. *ernes*; L. *arrha*, a deposit, a pledge]: money given in hand to assure a bargain; first-fruits; pledge; assurance; in Scot., ARLES, n. plu. *ár'lz* [Gael. *earlas*, earnest-money—from *earal*, provision, caution (see ARLES)]: a small sum given in hand, or

## EARNINGS—EAR-RING.

a simple ceremony such as shaking hands, to assure the mutual consent necessary to a contract. In the first case, the E. is pecuniary; in the second, symbolical. It is not the E. but the consent, i.e., the agreement to a certain price, that is the root of the bargain; and the E. thus becomes a mere adminicle of evidence, which may be dispensed with even in cases in which it is exacted by custom, if the parties choose to preserve other evidence of the completion of their bargain. The contracts in which E. has been most frequently given are sale and service. In the case of sale, it usually consists of a small sum paid by the buyer, by the acceptance of which the seller is held to bind himself to the sale; in the case of service, it is a small sum given by the master, in accepting which the servant becomes bound to serve. The question as to whether the E. shall count as part of the price or wage depends on the intention of the parties, which, in the absence of direct evidence, will be inferred from the proportion which it bears to the whole sum. 'If a shilling be given,' as Mr. Erskine says, 'in the purchase of a ship or a box of diamonds, it is presumed to be given merely in evidence of the bargain, or, in the common way of speaking, is dead earnest; but if the sum be more considerable, it is reckoned up in the price.'—*Institutes*, b. iii. tit. iii. s. 5. The original view of E. in England was, that it was a payment of a small portion of the price or wage, in token of the conclusion of the contract (Story on *Sales*, p. 216); and as this view seems to have been adhered to, the sum, however small, would probably there be counted as a part payment.

**EARNINGS:** see under EARN.

**EAR-RING:** ring suspended from the ear which is bored for the purpose. This mode of adorning the person has always been favorite among Orientals. By Persians, Babylonians, Lydians, Libyans, and Carthaginians, ear-rings were worn by both sexes. In the classical nations of antiquity, their use was confined to women. In the *Iliad* (xiv.



Ancient Ear-rings.

182, 183), Juno is represented as adorning herself with ear-rings made with three drops resembling mulberries. From this period till the latest, the practice prevailed in Greece, and we find the ears of the Venus de Medici pierced for the reception of ear rings. Pliny says (xi. 50) that there was no part of dress on which greater expense was lavished among the Romans; and Seneca mentions an E. of which a drawing, copied in our illustration (fig. 1), is given in Smith's *Dictionary*, which he says was worth a patrimony. It has four pearls, two above and two below the precious stone in the centre. In the more valuable of the antique ear-rings,



## EAR-SHELL.

pearls were almost always used; and they were valued for the completeness of their form as well as for their whiteness. In place of a ring, the ornament was often attached to the ear with a hook (see fig. 2), a custom which still prevails in Italy. Many Egyptian ear-rings of very beautiful design have been preserved, of which fig. 3 is an example. These antique designs have been imitated in modern times, and if the use of an ornament which seems fit for a South Sea islander is to be continued, it can scarcely take a more graceful form than was often given to it by the ancients. See RING. During the reigns of Elizabeth and James I., ear-rings were worn in England by men; a custom still continued by many sailors. Master Matthew, in *Every Man in his Humour*, says to Brainworm: 'I will pawn this jewel in my ear;' and Hall, in his *Satires* (B. vi. Sat. 1), speaks of the 'ringed ear' of the new-come traveller; and many passages to like effect might be quoted. At present in western nations, ear-rings are worn only by women. The ears are bored usually at about seven years of age. The boring, which produces a temporary inflammation, acts as a counter-irritant in cases of sore eyes; and this is sometimes given as a reason for putting rings in the ears.

EAR-SHELL: see HALIOTIS.

## EARTH.

**EARTH**, n. *érth* [Goth. *airtha*; Icel. *jord*; Ger. *erde*; AS. *eorthe*, earth: Gr. *erûzē*, to the ground]: mold; the mass of the globe; the ground; land; the world; its inhabitants; hole of a fox or of other vermin; a burrow; in *chem.*, a solid, opaque, friable substance, without lustre, and incombustible; in *Scrip.*, state of being carnal or temporary: V. to hide in the ground; to cover with mold; to burrow. **EARTH'ING**, imp. **EARTH'ED**, pp. *értht*. **EARTH'EN**, a. *érth'n*, made of earth. **EARTH'ENWARE**, n. household utensils made of clay and hardened in the fire (see **POTTERY**). **EARTH'LY**, a. *-lī*, pertaining to this world; gross; possible or conceivable as things are on the earth. **EARTH'LINESS**, n. **EARTH'LING**, n. *-līng*, an inhabitant of the earth; a mortal. **EARTH'Y**, a. *-ī*, consisting of, resembling, or relating to, earth; in *Scrip.*, sensual. **EARTH'INESS**, n. *-nēs*, quality of being earthy; grossness. **EARTH'QUAKE**, n. *-kwāk*, a shaking or trembling of the earth. **EARTH-BATTERY**, n. a large plate of zinc and a plate of copper, or a quantity of coke, buried at a certain distance asunder in damp earth. The moisture of the earth acts as the exciting fluid on this voltaic couple, and a feeble but constant current is produced. **EARTH-BORN**, earthly; human. **EARTH-BORER**, n. a form of auger for boring holes in the ground, where the strata are sufficiently soft and loose. The shaft has a screw-point and a cutting-face. The twisted shank revolves inside a cylindrical case, which retains the earth till the tool is withdrawn. The valve opens to admit the earth, and closes as the tool is lifted. **EARTH-GALL**, n. in *bot.*, the Gentian tribe of plants, one characteristic of which is bitterness, especially *Erythraea Centaurium*. **EARTH-LIGHT**; same as **EARTH-SHINE** (q. v.). **EARTH-NUT**, a kind of tuber growing wild in the earth; the pignut; the tubers of *Bunium bulbocastaneum* and *B. flexuosum*, ord. *Umbellif'éræ*. **EARTH-PLATE**, n. in *teleg.*, a plate buried in the earth, or a system of gas or water-pipes utilized for the purpose, connected with the terminal or return wire at a station, so as to utilize the earth itself as a part of the circuit, instead of using two wires, as was the practice previous to 1837. **EARTH-PUFF**, n. in *bot.*, species of *Lycopodon*. **EARTH-QUADRANT**, n. a quadrant (q. v.). **EARTH-TABLE**, n. in *arch.*, the lowest course of stone visible in a building, level with the earth. **EARTH-TONGUE**, n. in *bot.*, a popular name given to club-shaped fungi of the genus *Geoglossum*, of which word it is a literal translation. They are found on lawns and grassy pastures. **EARTHQUAKE-ALARM**, n. an alarm founded on the discovery or supposition that a few seconds previous to the occurrence of an earthquake the magnet temporarily loses its power. To an armature is attached a weight, so that upon the magnet becoming paralyzed, the weight drops, and, striking a bell, gives the alarm. **EARTH'S CRUST**, the external rind or shell of our planet accessible to human investigation. **BONE-EARTH**, a phosphate of lime existing in bones after calcination. **EARTH-FOAM**, a fine light scaly variety of calcite or calcespar. **EARTH-SHINE**, reflection from the moon to the earth of the light (originally from the sun) which the earth casts upon the



## EARTH.

moon; seen especially at the time of new moon, when sometimes the moon's whole surface is visible emitting an ashy light. EARTH-WORK, an embankment, cutting, or fortification made of earth. EARTH-WORM, a worm that lives in the ground; figuratively, a mean sordid creature. EARTH TO EARTH BURIAL, burial designed to aid in resolving a corpse as soon as possible into its constituent elements, instead of taking measures to impede its rapid decay. In 1875 this system was advocated by Mr. Seymour Haden. Discarding leaden and even wooden coffins, he advocated that wicker-work should be the material used. EARTHLY-MINDED, having a mind devoted to the things of the earth. EARTHY CALAMINE, n. same as HYDROZINCITE. EARTHY COBALT, n. same as WAD. EARTHY FRACTURE, n. in *minerals*, a fracture exhibiting a rough surface, with minute elevations and depressions. EARTHY MANGANESE, n. same as BOG MANGANESE. *Note.*—In *chem.*, the *metals of the earths* are 'aluminium, indium, and gallium': the *alkaline earths* are 'lime, strontia, and baryta.'—SYN. of 'earth, n.': country; soil; globe;—of 'earthly': grovelling; mean; sordid; base; vile; carnal; possible; conceivable.

EARTH, THE: the globe on which we live, the third planet in order from the sun, and largest within the belt of the Planetoids. For various special points, see separate titles.

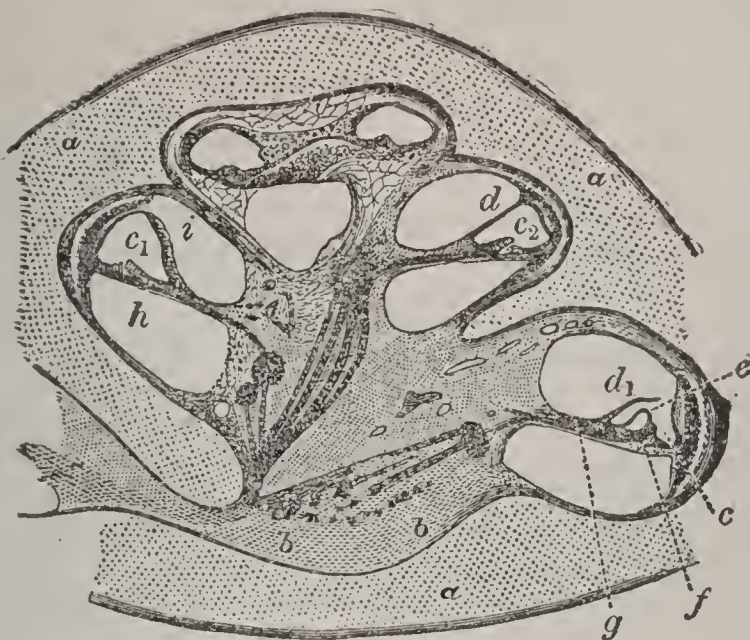
1. *The Form and Magnitude of the Earth.*—To a spectator so placed as to have an unobstructed view all round, it appears a circular plain, on whose circumference the vault of heaven seems to rest. Accordingly, in ancient times, even philosophers long looked upon the earth as a flat disk swimming upon the water.—But many appearances were soon observed to be at variance with this idea, and even in antiquity, the spherical form of the earth began to be suspected by individuals. It is only by assuming the earth to be spherical, that we can explain how our circle of vision becomes wider as our position is more elevated; and how the tops of towers, mountains, mast of ships, and the like come first into view as we approach them. There are many other proofs that the earth is a globe. Thus, as we advance from the poles toward the equator, new stars, formerly invisible, came gradually into view; the shadow of the earth upon the moon during an eclipse is always round; the same momentary appearance in the heavens is seen at different hours of the day in different places on the earth's surface; and lastly, the earth, since 1519, has been circumnavigated innumerable times. The objection to this view that readily arises from our unthinking impressions of up and down, which immediately suggest the picture of the inhabitants of the opposite side of the earth—our *antipodes*—with their heads downward, is easily overcome by considering that on all parts of the earth's surface *down* is toward the earth's centre.

It is not, however, strictly true that the earth is a sphere; it is an elliptical spheroid, that is, it is slightly flattened or compressed at two opposite points—the poles—as has been proved by actual measurement of degrees of latitude, and by observations of the pendulum. The earth's mean radius

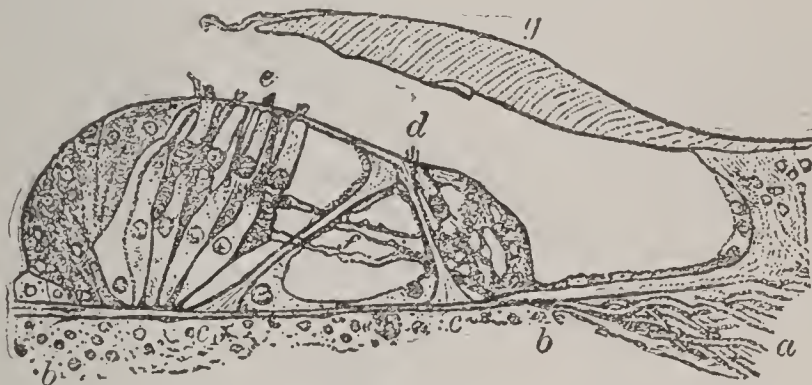
is somewhat less than 4,000 miles. It is found that a degree of a meridian is not everywhere of the same length (see DEGREE OF LATITUDE), as it would be if the earth were a perfect sphere, but increases from the equator to the poles; from which it is rightly inferred that the earth is flattened there. A pendulum, again, of a given length is found to move faster when carried toward the poles, and slower when carried toward the equator, which shows that the force of gravity is less at the equator than at the poles, or, in other words, that the centre, the seat of gravity, is more distant at the equator than at the poles. The diminished force of gravity at the equator has, it is true, another cause, namely, the centrifugal force arising from the rotation of the earth, which acts counter to gravitation, and is necessarily greatest at the equator, and gradually lessens as we move northward or southward, till at the poles it is nothing. But the diminution of the force of gravity at the equator arising from the centrifugal force amounts to only  $\frac{1}{289}$  of the whole force; while the diminution indicated by the pendulum is  $\frac{1}{194}$ . The difference, or  $\frac{1}{580}$  nearly, remains assignable to the greater distance of the surface from the centre at the equator than at the poles. From the most accurate measurements of degrees that have been made, the flattening or ellipticity of the earth has been determined by Bessel at  $\frac{1}{295.153}$ , or  $\frac{1}{300}$  nearly; or, the equatorial radius is to the polar as 300 to 299. These measurements of degrees determine not only the shape but the size of the earth. Bessel's calculations give a geographical mile, or the 60th part of a mean degree of the meridian, at 951.807 toises (2,029 yards, thus making the whole circumference 43,526,400 yards), and the equatorial and polar diameters at 6,875.6 and 6,852.4 geographical miles (7,925.6 and 7,899.14 English imperial miles). The surface of the earth contains nearly 150 millions sq. geographical miles.

2. *The Mass and Density of the Earth.*—Nothing astonishes the young student more than the idea of weighing the earth; but there are several ways of doing it; and unless we could do it, we never could know its density. (1) The first method is by observing how much the attraction of a mountain deflects a plummet from the vertical line. This being observed, if we can ascertain the actual weight of the mountain, we can calculate that of the earth. In this way, Dr. Maskelyne, 1774-76, by experiments at Schibhalion (in Perthshire, Scotland), a large mountain mass lying e. and w., and steep on both sides—calculated the earth's mean density to be five times greater than that of water. The observed deflection of the plummet in these experiments was between 4" and 5". (2) In the method just described, there must always be uncertainty, however accurate the observations, in regard to the mass or weight of the mountain. The method known as *Cavendish's experiment* is much freer from liability to error. This experiment was made first by Henry Cavendish on the suggestion of Michel, and repeated by Reich of Freyberg, and Francis Baily. The apparatus used by Mr. Baily is represented in the annexed figure. Two small balls at the

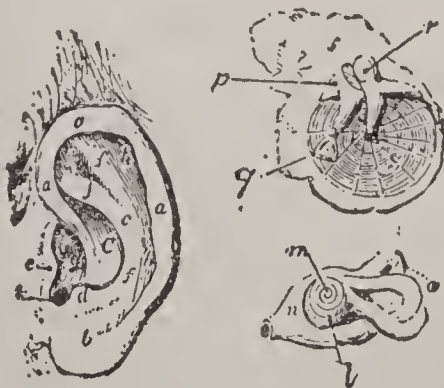




**Ear.**—Section through the Cochlea of a Human Embryo: *a, a, a*, Cartilage, which afterward ossifies; *b, b*, Tissue, which afterward becomes the modiolus; *c-c2*, Duct of the cochlea; *d, d1*, Membrane of Reissner; *e*, Membrane tectatoria, rather elevated from its proper position; *f*, Position afterward occupied by organ of Corti; *g*, Lamina spiralis; *h*, Scala tympani; *i*, Scala vestibuli.



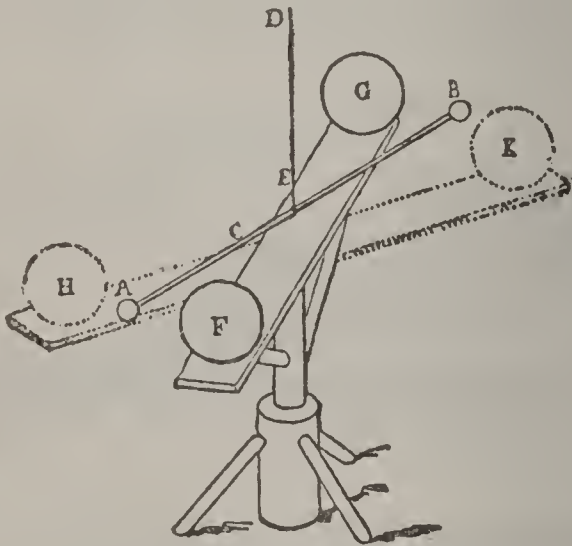
**Ear.**—*a*, Lamina spiralis ossea, with nerve bundles from cochlear nerve; *b, b*, Lamina spiralis membranacea; *c*, Inner rod or pillar of Corti; *c1*, Outer rod or pillar of Corti; *d*, Inner hair-cell; *e*, Outer hair-cells; *f*, Nerve fibres; *g*, Membrana tectatoria.



**Parts of the Human Ear:** *C*, Concha; *a*, Helix; *b*, Lobe; *c*, Antihelix; *d*, Antitragus; *e*, Tragus; *f*, Crura of antihelix; *g*, Fossa navicularis; *h*, Fossa innominata; *k*, Auditory opening; *l*, Scala; *m*, Cochlea; *n*, Vestibule; *o*, Semicircular canals; *p*, Incus or anvil; *q*, Stapes; *r*, Malleus or hammer; *s*, Membrane of the tympanum or drum.

## EARTH.

extremities of a fine rod AB, are suspended by a wire DE, and their position carefully observed by the aid of a telescope. Large balls of lead, G, F, placed on a turning-frame, are then brought near them in such a way that they can affect them only by the force of their attraction. On the large balls being so placed, the small ones move toward them through a small space, which is carefully measured. The position of the large balls is then reversed (they are brought into the positions K, H), and the change of position of the small balls is again observed. Many observations are made, till the exact amount of the deviation of the small balls is ascertained beyond doubt. Then by calculation the amount of attraction of the large balls to produce this deviation is easily obtained. Having reached this, the next question is, what would their attraction be if they were as large as the earth? This is easily answered, and hence, as we know the attractive force of the earth, we can at once compare its mean density with that of lead. Mr. Baily's experiments lead to the result that the earth's mean density is 5.67 times that of water. (3) A third mode adopted by Sir G. B. Airy, was by comparison of two



Baily's Apparatus.

Invariable pendulums, one at the earth's surface, the other at the bottom of a pit 1,260 ft. below the surface. The density of the earth, as thus measured, was somewhat greater; but the results are somewhat uncertain and are not to be relied on. If the globe as a whole has a density of say 5.5, the interior parts must be much denser than the crust, whose solid materials have an average specific gravity of 2.5 only. Probably the matter of the interior is of an essentially heavier nature, perhaps largely metallic. The density of the earth being known, its mass is easily calculated, and made a unit of mass for measuring that of the other bodies in the system. It is found that the mass of the earth compared with that of the sun is .0000028173.

3. *The Motions of the Earth.*—The earth, as a member of the solar system, moves with the other planets round the



## EARTH.

sun from west to east. This is contrary to our sensible impressions, according to which the sun seems to move round the earth; and it was not till a few centuries ago that men were able to overcome this illusion. See COPERNICAN SYSTEM. This journey round the sun is performed in about  $365\frac{1}{4}$  days, which we call a year (solar year). The earth's path or orbit is not strictly a circle, but an ellipse of small eccentricity, in one of the foci of which is the sun. It follows that the earth is not equally distant from the sun at all times of the year; it is nearest, or in perihelion, at the beginning of the year, or when the northern hemisphere has winter; and at its greatest distance, or aphelion, about the middle of the year, or during the summer of the northern hemisphere. The difference of distance, however, is comparatively too small to exercise any perceptible influence on the heat derived from the sun, and the variation of the seasons has a quite different cause. If the mean distance be taken as unity, the greatest and least are respectively 1.01679 and 0.98321. Till lately, the mean distance was stated at 95,000,000; but determinations obtained from the transit of Venus, 1874, fix it at 92,400,000, miles. The earth therefore yearly describes a path of upward of 580 millions of miles; and its velocity in its orbit is about 18 miles in a second. (Other recent calculations give 93,321,000 m. as the mean distance.)

Besides its annual motion round the sun, the earth has a daily motion or rotation on its axis, or shorter diameter, which is performed from west to east, and occupies exactly 23 hours, 56 minutes, 4 seconds of mean time. On this motion depend the rising and setting of the sun, or the vicissitudes of day and night. The relative lengths of day and night depend upon the angle formed by the earth's axis with the plane of its orbit. If the axis were perpendicular to the plane of the orbit, day and night would be equal during the whole year over all the earth, and there would be no change of seasons; but the axis makes with the orbit an angle of  $23\frac{1}{2}^{\circ}$ , and the consequence of this is all that variety of seasons and of climates that we find on the earth's surface; for it is only for a small strip (theoretically, for a mere line) lying under the equator that the days and nights are equal all the year; at all other places, this equality occurs only on the two days in each year when the sun seems to pass through the celestial equator, i.e., about Mar. 21 and Sep. 23. From Mar. 21, the sun departs from the equator toward the north, till, about June 21, he has reached a north declination of  $23\frac{1}{2}^{\circ}$ , when he again approaches the equator, which he reaches about Sep. 23. He then advances southward, and about Dec. 21 has reached a south declination of  $23\frac{1}{2}^{\circ}$ , when he turns once more toward the equator, at which he arrives, Mar. 21. June 21 is the longest day in the n. hemisphere, and the shortest in the s; with Dec. 21 it is the reverse.

The velocity of the earth's rotation on its axis evidently increases gradually from the poles to the equator, where it is about equal to that of a musket-ball, being at the rate of 24,840 m. a day, or about 1,440 ft. in a second.

## EARTH

A direct proof of the rotation of the earth is furnished by its compression at the poles. There are indubitable indications that the earth was originally fluid, or at least soft; and in that condition it must have assumed the spherical shape. The only cause, then, that can be assigned for the fact that it has not done so, is its rotation on its axis. Calculation also shows that the amount of compression which the earth actually has, corresponds exactly to what its known velocity and mass must have produced. Experiments with the pendulum, too, show a decrease of the force of gravity from the poles toward the equator; and though a part of this decrease is owing to the want of perfect sphericity, the greatest part arises from the centrifugal force caused by the motion of rotation. Another direct proof of the same hypothesis may be drawn from the observation, that bodies dropped from a considerable height deviate toward the east from the vertical line. This fact has been established by the experiments of Benzenberg and others. In former times, it was believed that if the earth actually revolved in the direction of east, a stone dropped from the top of a tower would fall, not exactly at the foot of the tower, but west of it. Now, as experience, it was argued, shows that this is not the case—that the stone, in fact, does fall at the bottom—we have here a proof that the pretended rotation of the earth does not take place. Even Tycho Brahé and Riccioli held this objection to the doctrine to be unanswerable. But the facts of the case were just the reverse. Newton, with his wonted clearness of vision, saw that, in consequence of the earth's motion from west to east, bodies descending from a height must decline from the perpendicular, not westward, but eastward; since, by their greater distance from the earth's centre, they acquire at the top a greater eastward velocity than the surface of the earth has at the bottom, and retain that velocity during their descent. He therefore proposed that more exact observations should be made to ascertain the fact; but it was not till more than a century afterward that experiments of sufficient delicacy were made to bring out the expected result satisfactorily. It is difficult to find an elevation sufficiently great for the purpose, as several hundred feet give merely a slight deviation, which it requires great accuracy to observe. If a height of 10,000 ft. could be made available, the deviation would be not less than  $7\frac{1}{2}$  ft. The analogy of our earth to the other planets also may be adduced, the rotation of which, with the exception of the smallest and the most distant, is distinctly discernible. Finally, an additional proof of the earth's rotation was lately given by Léon Foucault's striking experiment with the pendulum. The principle of the experiment is this: that a pendulum once set in motion, and swinging freely, continues to swing in the same plane, while at any place at a distance from the equator the plane of the meridian continues to change its position relative to this fixed plane.—The objection to the doctrine of rotation from the fact that we are unconscious of any motion, has little weight. The movement of a vessel in smooth water is not felt, though



## EARTH-CLOSET—EARTH-HOUSES.

far less uniform than that of the earth; and as the atmosphere accompanies the earth in its motion, there is no feeling of cutting through it to break the illusion of rest.

If the turning of the earth on its axis is thus proved to be the cause of the apparent daily motion of the heavens, it is an easy step to consider the annual motion of the sun through the constellations of the zodiac as also apparent, and arising from a revolution of the earth about the sun in the same direction of west to east. If we consider that the mass of the sun is about 359,000 times greater than that of the earth, and that by the laws of mechanics, two bodies that revolve round each other, must revolve about their common centre of gravity, the idea of the sun revolving about the earth is seen to be simply impossible. The common centre of gravity of the two bodies being distant from the centre of each inversely as their respective masses, is calculated to be only 267 m. from the centre of the sun, and therefore far within his body, which has a diameter of 882,000 miles. But by help of a figure, it is easy to show that the apparent motion of the sun on the ecliptic naturally arises from a motion of the earth about the sun. The motions of the planets also, that appear so complicated and irregular as seen by us, can be satisfactorily explained only by assuming that they too revolve round the sun in the same direction as the earth. See PRECESSION: NUTATION for an account of a small periodic motion of the earth's axis and its effects.

4. *The Earth's Temperature.* See METEOROLOGY and TERRESTRIAL TEMPERATURE as to the phenomena of heat on the earth's surface. As we go below the surface, we reach a depth beyond which the interior of the earth seems to have no sympathy with the external causes of heat or cold, and its heat appears to be its own, and to increase according to a fixed law the deeper we descend. The average rate of observed increase is  $1^{\circ}$  F. for a descent of 64 ft. (average). If this law were universal—which we do not know it to be—at a depth of less than 30 m. the heat would be such as to hold in fusion all known substances, and the earth would have to be regarded as a very thin crust or shell full of molten liquid. This theory of a molten interior obtained at one time extensive currency among philosophers being indorsed with the names of Fourier and Humboldt; but it has since been found inconsistent with the rigidity which astronomical observations prove the earth to possess. A liquid nucleus would be subject to tides like the ocean, and the crust would partake of the motion. Granting the increase of heat to be constant, we do not know what effect the increasing pressure (according to the view now perhaps prevalent) may have in preventing fusion.

EARTH-CLOSET: see SEWAGE EARTH-CLOSET

EARTH HOUSES, or EIRD-HOUSES, *yird-*, or YIRD-HOUSES, *yèrd-*: name in Scotland for the underground buildings, which in some places are called also 'Picts' HOUSES' (q.v.) and in others, it appears, 'Weems,' or

## EARTH-NUT.

caves. Martin, in his *Description of the Western Islands* (1703), when their use seems to have been still remembered, speaks of them as 'little stone-houses, built under ground, called earth-houses, which served to hide a few people and their goods in time of war.' The earth-house, in its simplest form, is a single irregularly-shaped chamber, four to ten ft. in width, 20 to 60 ft. in length, and four to seven ft. in height, built of unhewn and uncemented stones, roofed by unhewn flags, and entered from near the top by a rude doorway, so low and narrow that only one man could slide down through it at a time. When the chamber is unusually wide, the side-walls converge, one stone overlapping another, until the space at the top can be spanned by stones of four or five ft. in length. In its more advanced form, the earth-house shows two or more chambers, communicating with one another by a narrow passage. There are instances in which one of the chambers has the circular shape and dome-roof to which archæologists have given the name of the 'BEEHIVE-HOUSE' (q.v.). Occasionally, as many as 40 or 50 earth-houses are found in the same spot, as in the moor of Clova, not far from Kildrummy, in Aberdeenshire. They appear to have been built almost invariably in dry places, such as gravelly knolls, steep banks of rivers, and hill sides. They are generally so near the surface of the ground, that the plow strikes upon the flagstones of the roof, and thus leads to their discovery. The object most frequently found in them is a stone quern, or hand-mill, not differing from that which continued to be used in remote corners of Scotland within the memory of living men. With the quern are generally found ashes, bones, and deers' horns; and more rarely small round plates of stone or slate, earthen vessels, cups and implements of bone, stone celts, bronze swords, gold rings, and the like. Occasionally, the surface of the ground beside the earth-house shows vestiges of what are supposed to have been rude dwelling-houses, and folds or inclosures for cattle. This, with other things, may indicate that the earth-houses of Scotland and Ireland (for they are found in that island also) were put to the same purpose as the caves which, as Tacitus (writing in the 2d c.) tells us, the Germans of his day dug in the earth, as storehouses for their corn, and as places of retreat for themselves during winter, or in time of war.

**EARTH-NUT:** popular name of the tubers of certain umbelliferous plants, particularly *Bunium bulbocastanum* and *B. flexuosum*, common in most parts of Europe. Names of the same signification are given to them in a number of European languages. *Arnut*, *Yernut*, and *Jurnut*, Scotch and English provincial names, are corruptions of earth-nut. **PIG-NUT** is another common English name, pigs being very fond of these tubers, grubbing up the ground in quest of them, and soon becoming fat upon them. They are called also *earth-chestnut*, from their resemblance in taste and qualities to chestnuts, perhaps also from their resemblance in size, and their being black or very dark brown externally, and white within. By some they are preferred to



## EARTH-NUT.

chestnuts, and they are much used for food in different parts of Europe, and occasionally in some parts of England, either roasted or in soups. They are wholesome and nutritious; they form an article of trade in Sweden, and have sometimes been recommended as worthy of attention and careful cultivation. The two species are very similar in general appearance, although *B. bulbocastanum* has by some botanists been referred to the genus *Carum* (Caraway), because its carpels have single vittæ between the ribs, while *B. flexuosum* has three. The former is also a plant of stouter habit. Both have umbels of small white flowers, much divided leaves with very narrow segments, and a single roundish tuber at the root of each plant. *B. flexuosum* is common in woods, pastures, waysides, etc., in most parts of Britain. *B. bulbocastanum* is found in some chalk districts of England, and is abundant in many parts of Europe. *B. ferulaceum* likewise affords tubers, are used as food in Greece.—The somewhat similar tubers of another umbelliferous plant, *Oenanthe pimpinelloides*, which grows in the pastures of some parts of the south of England, are also sometimes used for food, notwithstanding the very poisonous qualities of some of its congeners. See WATER-DROP-WORT.—A Hinnalayan umbelliferous plant (*Chærophyllum tuberosum*), a species of chervil (q.v.), yields edible tubers or *earth nuts*.—The name E. is sometimes extended to other small tuberous roots of similar quality, though produced by plants widely remote in the botanical system, as *Apios tuberosa* and *Lathyrus tuberosus*: see APIOS and LATHYRUS.

In the United States, the name Earth-nut or Ground-nut is applied sometimes to the Peanut (q.v.); and it is a name also of the Wild Bean (*Apios tuberosa*), a common leguminous plant climbing over bushes, the brown-purple, violet-scented flowers in close, short racemes, the long incurved keel becoming coiled, the stems with some milky juice, and the tubers edible. The name Ground-nut is given also to the Dwarf Ginseng (*Aralia trifolia*), common in rich woods at the north, stem 4–8 in. high, with a whorl of 3–5 sessile leaflets, and an umbel of flowers becoming yellowish berries; the globular tuber, deep in the ground, is pungent, but not aromatic like the large fusiform root of our better known Ginseng (*A. quinquefolia*): see GINSENG.

## EARTHQUAKE.

**EARTHQUAKE:** any tremor or shaking of the solid crust of the earth. The frequent occurrence of earthquakes, their destruction of life and property, their influence upon the solid surface of the earth, and the mysteriousness of their cause, force them upon man's attention. It is estimated that 12 or 13 earthquakes, destructive more or less of life and property, occur every year. Indeed, the earth is never free from tremors, as indicated by delicate instruments, which also reveal the fact that in even violent shocks the actual movement of the ground is surprisingly small, and, moreover, is often in directions so complicated that different persons give conflicting reports. In the most destructive shocks whole cities and districts have been laid waste; and enormous masses of human beings have lost their lives. No less than 60,000 perished in the great Lisbon earthquake, 1755; and in that of Calabria, in the end of last c., 40,000 were destroyed. It is estimated that as many as 13,000,000 of the human race have thus perished. The great changes which earthquakes produce on the earth's surface disclose to the geologist an agency which seems to have been at work during every period of the earth's history, and which has altered the earth's surface to an extent that can scarcely be imagined. The observed results of earthquakes which more immediately demand his attention are such as these: the new lakes and river-courses which they form, at the same time obliterating the old ones; the new valleys due to subsidences; the fissures of various sizes that they form; and, the immense landslips that they frequently produce. Also the mysterious nature of the producing cause of earthquakes is a strong incentive to their study. It is unfortunately true, that the most popular scientific inquiries are those in which the imagination has large play: dry inductions from observed phenomena are not suited to the genius of popular modern science. Consequently, earthquakes, where every attempt at explaining their origin is theoretical, from the impossibility of obtaining direct observation, affording as they do a wide field for the play of the poetic faculty, find numerous students.

No portion of the earth's surface is exempt from the influence of earthquakes. Egypt has been less visited than perhaps any other country, but even there we have the record of one which took place 1740; Holland also with its loose alluvial deposits, has felt their power. Nor is the bed of the ocean exempt; records of many subaqueous earthquakes exist, taken by vessels at sea, sometimes passing over the point of greatest disturbance at the moment of the shock. In like manner earthquakes have been active at every period of the earth's existence, breaking up its solid crust, elevating or depressing its surface, and doing as much as any other single agent to bring it into its present condition. They have been probably at some periods more active than at others, as we find that some districts are now more liable than others to their visitation. So well defined, indeed, are the localities where earthquakes occur, that it is easy to exhibit their limits on a map. They are most

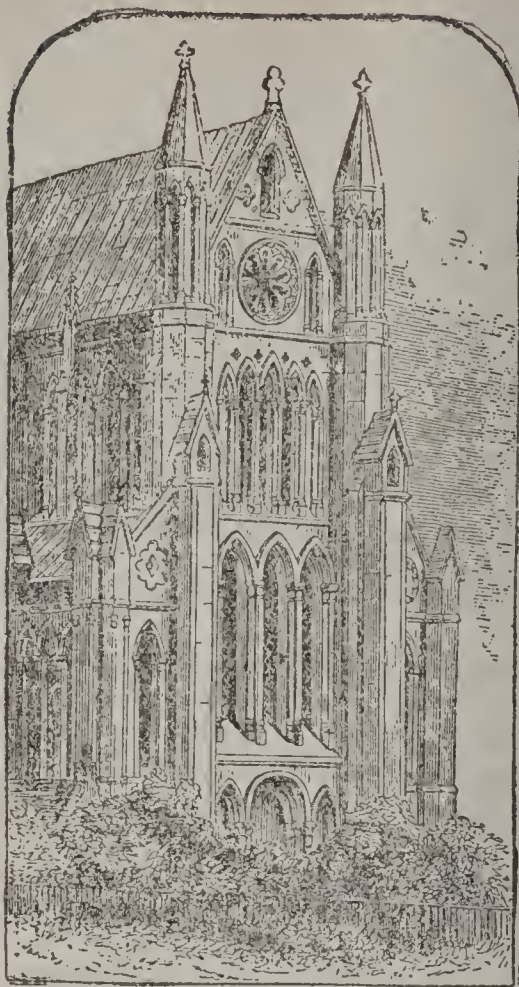


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frequent around the present lines or centres of volcanic action (see VOLCANO); and their frequency and violence seem to bear some relation to the activity and intensity of the associated volcanoes. Observers of volcanic phenomena have noticed that every great eruption, in whatever part of the world observed, and whether from a volcanic vent on land or beneath the ocean, is accompanied by earthquake shocks of greater or less violence and duration; while, on the other hand, those observing earthquakes speak of them as accompanied by volcanic eruptions, and of their often ceasing on the opening of volcanic vents. It is, however, an important fact that, though regions of active volcanic action are those of most frequent earthquake movements, yet the most violent earthquakes do not appear to have occurred in these regions, but, on the contrary, in districts lying some degrees away from the nearest volcanic action, as, for instance, in the famous earthquake of Lisbon. Districts in which there are extinct volcanoes are not more liable to such visitations than non-volcanic regions.

The phenomena connected with earthquakes have been variously described. Many writers refer to appearances in the heavens, or changes in the atmosphere, which to them seem to have some connection with the earthquake. They tell of irregularities in the seasons preceding or following the shock, of sudden gusts of wind interrupted by sudden calms, of violent rains at unusual seasons, or in countries where such phenomena are almost unknown, of a reddening of the sun's disk, of a haziness of the air often continued for months, and similar phenomena. But these are so irregular in their appearance, and have been so seldom observed associated with more than a single earthquake, that, in the absence of any decided reason to the contrary, there seem no grounds for believing that they have real connection with the earthquake. It is different with underground noises, which frequently precede, accompany, or succeed the occurrence of earthquakes, or some of the shocks of them. They are undoubtedly intimately connected with the shock, yet earthquakes occur, even of the greatest violence, unaccompanied by any sound whatever. Different descriptions have been given of these subterranean noises. In some earthquakes, they are likened to chains pulled about, increasing to thunder; in others, the sound is like the rumbling of carriages, growing gradually louder, until it equals the loudest artillery; or like heavy wagons running away upon a road; or distant thunder; or like the hissing produced by the quenching of masses of red-hot iron in water; or like the rush of wind underground. As there have been earthquakes without subterranean noises, so there are frequently, in S. America and elsewhere, underground sounds not followed by earthquakes.

The more intimate earthquake-phenomena are more uniform. Sometimes there is nothing else felt than a trembling or gentle motion of the surface, without producing any injury. In severe earthquakes, the almost invariable succession of phenomena is first a trembling, then a severe



Early English Style.—Northwest Transept of Beverley Minster.



Early English Architecture.—West  
Front of Salisbury Cathedral.



Ear-trumpet.



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shock, or a succession of shocks, and then a trembling, gradually becoming insensible. The violent shocks are instantaneous, and very few in number, sometimes only one, usually not more than three or four. In the intervals between these, smaller shocks or tremblings take place. The severe shocks do the mischief. At the point or line of greatest disturbance, the shock has a distinctly vertical direction, coming from below upward. As we leave this point, the direction of the motion becomes more and more horizontal, gradually also decreasing in intensity until it becomes insensible. This progressive movement is produced by an earth-wave or true undulation of the solid crust of the earth. The whole mass of the area is not moved at once, but only the wave-crest. In the earthquake, 1870, Oct. 19, including area between Quebec, St. John, N. B., New York, and Chicago, the velocity of the wave was estimated 14,000 ft. per second. In 1886, Aug. 31, a shock included 20 states. In the case of the earthquake at Lisbon, the progress of the wave was roughly calculated; it was shown to have had very great velocity, and to have lasted only for an instant at any one spot. The area affected on this occasion was very extensive. The shock was felt on one side as far as the s. shores of Finland, and on the other it reached beyond the St. Lawrence in Canada, occasioning high waves in the harbors of New York and Boston, and was observed in some of the W. India Islands—an area of no less than 7,500,000 sq. miles. The force required to move this must have been enormous, for, suppose the thickness of the earth's crust moved to have been no more than 20 m., then 150,000,000 cubic m. of solid matter was moved. The influence of such an earth-wave is communicated to the sea, when the earthquake is near the shore, or on the bed of the ocean. The sea swells, and slightly retires from the beach, and then a great wave rolls in upon the shore. At the Lisbon earthquake, this wave rose to a height of 60 ft. at Cadiz. It carries with it sea-spoil, scattering it over the surface of the earth.

The general cause of ordinary earthquakes is now believed to be the constant shrinkage of the crust, with accumulating tension resulting at intervals in sudden sliding, fracture, elevation or depression of strata; and occurring mostly where a lateral thrust from the great ocean areas of depression acts upon borders of the more stable continents, the mountain borders being records of this action past.

Other causes may participate in this general one. When Davy discovered the metallic bases of the earths and alkalies, he threw out the idea that those metals might abound in an unoxidized state in the subterranean regions, to which water must occasionally penetrate. When this occurred, gaseous matter would be set free, sufficient to produce the earthquake, the metals would combine with the oxygen of the water, and heat enough would be evolved to melt the surrounding rocks.

Mr. Mallet, in an elaborate report on the subject presented to the British Assoc., proposed an ingenious theory. He assumes that volcanoes, and the centres of earthquake

## EARTHS—EARTHWORKS.

disturbances, are near the sea, or other large supplies of water; and he says that when an irruption of igneous matter takes place beneath the sea-bottom, the first action must be to open up large fissures in its rocky material, or to lift and remove its incoherent portions, such as sand, mud, gravel, etc. The water on meeting the heated surfaces assumes the spheroidal state; while in this condition, the intestine motion may be great, but little steam is generated; but no sooner have the surfaces cooled, than the water comes into close contact with them, and a vast volume of steam is evolved explosively, and blown off into the deep and cold water of the sea, where it is condensed, and thus a blow of the most tremendous sort is given at the volcanic focus, and being transferred outwardly in all directions, is transmitted as the earthquake shock. The surfaces of the ignited material, however, now cooled down below the point at which steam can be generated rapidly, merely keep up a gentle ebullition, which is transmitted as the trembling after the shock. On the surfaces again becoming heated by conduction from the molten mass, the various phases are again repeated. This he considers the chief cause of earthquakes, but he supposes that they may be due also to the evolution of steam through fissures, and its irregular and *per saltum* condensation under pressure of sea-water; or to great fractures and dislocations in the rocky crust, suddenly produced by pressure acting on it from beneath, or in any other direction.

The old assumption that the earth consists of a molten fluid core with a cooled and hardened rind floating upon it, is now generally deemed inconsistent with the rigidity that astronomers have proved the earth to possess. But though the earth must be mainly solid, it is yet believed to be of a honey-combed structure, and that the cavities contain in many places lakes of molten rock, between which and the surface volcanoes are orifices of communication. Into these cavities, water sinking down through crevices from the ocean or the land must be constantly finding its way; and the steam thus generated exerts such enormous pressure as to force the molten matter to the surface, itself mingling and escaping with it. A later doctrine is that all sedimentary deposits contain enough water to supply steam for earthquake explosions, when the deposits subside to regions of intense heat; so that water from the ocean is not needed. See Shaler's *Aspects of the Earth* (1889).

EARTHS, in Chemistry: class of substances regarded by the alchemists and older chemists as elementary, and which are insoluble in water. The earths *proper* are now known to be compound, consisting of a metal in combination with oxygen. The list includes Alumina, Glucina, Zirconia, Thoria, Didymia, Lantania, Ceria, Yttria, Terbia, Erbium. They do not alter vegetable colors, are soluble in acids, and are precipitated from their solutions by ammonia, potash, or soda. For the *Alkaline Earths*, see ALKALIES.

EARTHWORKS, in Fortification: general name for all military constructions, whether for attack or defense, in



## EARTHWORM.

which the material employed is chiefly earth. The word *earthwork*, however, has lately received new importance, in reference to a discussion among military engineers, whether earthwork defenses generally are better or worse than those of masonry. The fracture of the Russian granite fortifications at Bomarsund, and, on the other hand, the obstinate defense made within the earthen defenses at Sebastopol, led many writers, about 1855, to express a preference for earthworks instead of stoneworks. Mr. J. Fergusson (*Portsmouth Protected*, 1856) especially advocated this view. The reasons urged are—that masses of earth can be more quickly and cheaply put up than masses of masonry; that in most places earth is more readily obtained than stone; that if an earthwork be knocked to ruin by balls and shells, it can be repaired in a very short time; and that the defenders are not exposed to so much injury as in masonry-works, where splinters of stone fly about in a perilous way. The late Sir John Burgoyne, leading military engineer in England of his day, combated these views. He contended, among other things, that as a given amount of cannonading will make a much larger breach in earthwork than in stonework, the latter is best fitted to prevent capture by assault. He insisted that earthworks should be regarded rather as temporary expedients than as purposed and permanent constructions; and he claimed the authority of continental engineers in support of this opinion. See further under FORTIFICATION.

**EARTH WORM** (*Lumbricus*): genus of *Annelida* (q.v.), of sub-order *Oligochaeta*. There are many species, all closely resembling in characters and habits the common E. or Dew-worm (*L. terrestris*), everywhere in the arable United States. It has no head distinct from the body, no eyes, no antennæ, nor any organs external to the rings of which its body is composed, except minute bristles pointing backward, of which each ring bears four pair, and which are of use in its locomotion. It sometimes attains nearly a foot in length, and more than 120 rings have been counted in its body. The end at which the mouth is situated is pointed, and the tail is flattened, while the general form is cylindrical. The mouth consists merely of two lips, the upper lip elongated; there are no teeth nor tentacles, and the worm subsists by swallowing fine particles of the soil, from which its digestive organs extract the digestible matter, the rest being voided often in little intestine shaped heaps, called *worm-casts*, on the surface of the ground. The locomotion of



Earthworm (*Lumbricus terrestris*):

a, earthworm; b, anterior extremity, showing the mouth (the bristles are also shown); c, egg, containing two young; d, young escaping from the egg.

## EAR-TRUMPET.

the E. is effected by means of two sets of muscles, which enable it to contract and dilate its rings; its bristles preventing motion backward, and the whole muscular effort thus resulting in progress; while the expansion of the rings, as it contracts the anterior segments, and draws forward the hinder parts, widens a passage for it through earth whose particles were close together before. Earthworms are thus of very great use, their multitudes continually stirring and loosening the soil through which they work their way; and moles, pursuing them to feed on them, stir and loosen it still more; while worm casts gradually accumulate on the surface to form a layer of the very finest soil, to which it is supposed that the best old pastures in a great measure owe their high value.

Earthworms do not often visit the surface of the ground, except during night, and when the ground is moist. In the evening, during or after rain, or in the morning when the dew is abundant, they may sometimes be seen travelling about in great numbers. Both drought and cold cause them to retreat more deeply into the earth.—Their respiration is effected by means of little sacs, which communicate by minute pores with the external air. They are hermaphrodite, but mutual fecundation takes place by means of the thickened knot (*clitellum*) which is situated in front of the middle of their body. Their eggs often contain two embryos, and the young worms escape by a sort of valvular opening at the end.

Besides their usefulness in the improvement of the soil, earthworms are of importance as food for birds, fishes, etc. They are much sought as bait for fishes. The instinct which prompts them to hasten to the surface when, in quest of bait, the angler shakes the soil with a spade or fork, is perhaps to be referred to the similar shaking on the approach of their constant enemy, the mole.

An E. of great size is common in the E. Indies, wherever the climate is moist, from the Himalaya to Ceylon and Java. It is *Icthyophis glutinosus*. Much interesting light was thrown on earthworms in Mr. Darwin's work, *The Formation of Vegetable Mold through the Action of Worms* (1881).

**EAR'-TRUMPET:** contrivance for improving the hearing of the partially deaf. For this purpose, many ingenious instruments have been devised. The principle in them all is the same: to collect the sonorous vibrations, and to convey them in intensified form to the deeper parts of the ear. In this way, the hand placed behind the external ear constitutes the simplest form of ear-trumpet. Ear-trumpets should not be used indiscriminately, for in unsuitable cases they often do much mischief, both by increasing the deafness, and aggravating the noises in the head from which deaf persons often suffer so much. They are of most use, perhaps, in advanced cases of nervous deafness, though injurious in the early stages of this complaint; they are hurtful also in all acute diseases of the organ, and of little or no use in those cases of great thickening of the contents of the middle ear, where the adapting power of the organ



## EARWIG.

has been lost. There are many varieties of E. T. in common use. The most useful and comfortable are those worn on the head, which are termed ear-cornets or acoustic auricles. They can be concealed under the hair or cap, and may be adapted to one or both ears by means of a spring over the head. The apparatus commonly in use requires to be held in the hand, and consists of a narrow portion inserted into the ear-passage, and which gradually expands into a wide mouth; or the extremity of the instrument may be turned downward, as in the form which has been named Miss Martineau's trumpet. Another variety, applicable to the more severe cases of deafness, consists of an elastic tube, one end of which is tipped with ivory, and is placed in the ear of the patient; the other is held in the hand of the speaker, who applies his mouth to the open extremity. With this instrument, only one voice can be heard at a time. With the first-mentioned variety, general conversation can be heard often quite well. Ear-trumpets are generally made of some thin metallic substance, such as tin. Gutta-percha, vulcanite, and other substances, also are frequently used.

**EARWIG (*Forficula*):** genus of orthopterous insects recently subdivided into a number of genera, and forming the family *Forficulidæ*, which many entomologists constitute into a distinct order, *Dermaptera* [Gr. leather-winged].



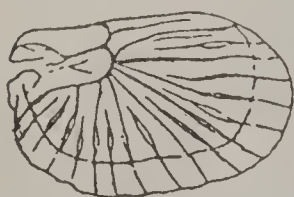
Earwig:

1, female sitting on her eggs; 2, young just emerged from eggs.

These insects indeed connect the true *Orthoptera* with the *Neuroptera*. Their legs are formed for running, and not for leaping; their wing-covers (*elytra*)—which are very small, and hide only a small part of the abdomen—are of firmer substance than in the other *Orthoptera*; the wings, of which the structure is membranous, with radiating veins, are folded twice, both longitudinally, in a fanlike manner, and transversely; the organs of the mouth resemble those of the true *Orthoptera*, with which also earwigs agree in the im-

## EARWIG.

portant character of *semi-complete* metamorphosis; the larvæ and pupæ much resembling the perfect insect, running about and feeding in the same manner, but the larvæ being destitute of wings and wing-covers, the pupæ having them only in a rudimentary state. Earwigs have the body narrow, and of nearly equal breadth throughout, the head exposed, the mandibles very strong and horny, the antennæ long and thread-shaped. The abdomen bears at its extremity a large pair of forceps, apparently of use as an instrument of defense. Earwigs abound in moist situations, as under the decayed bark of trees, under stones, among decaying straw, etc. They feed on both animal and vegetable food; the COMMON E. (*F. auricularia*), very abundant in Britain and in most parts of Europe, is troublesome to gardeners by eating the leaves of plants and petals of fine flowers; but the injury which it does is probably more than compensated, particularly as to field-crops, by the destruction of multitudes of smaller insects, as *thrips*, *aphis*, etc. The appearance of this insect is far from agreeable, and its mandibles and forceps are suggestive of unpleasant possibilities, which, however, seem never to be realized, though it is a frequent visitor of houses, particularly those of which the walls are covered with foliage. It is curious how extensively prevalent the notion is that earwigs creep into the ear. To this they owe their English name E. (from *ear*, and Sax. *wiega*, a worm or grub), according to one supposition. But it is likely that, as in the French name for these insects, *Perceoreille* (ear-piercer), the name was suggested by the resemblance of the adult



Hind Wing of Earwig, magnified.

caudal forceps to an instrument used to pierce the ear for the wearing of ear-rings. Others, with little probability, derive the name from the ear-like outline of the hind wings. In the United States, where these insects are not common enough to annoy gardeners, the name is absurdly given to some myriapods. No E. is known to have entered a human ear. Of their habit of creeping into holes, particularly to hide during the day, gardeners take advantage to make earwig-traps of different descriptions.

It is an interesting peculiarity in the habits of these insects that the female E. sits upon her eggs and hatches them like a hen; she also gathers her young ones around her and under her in the most affectionate manner. The observations of De Geer on this point have been confirmed by Mr. Spence and others.



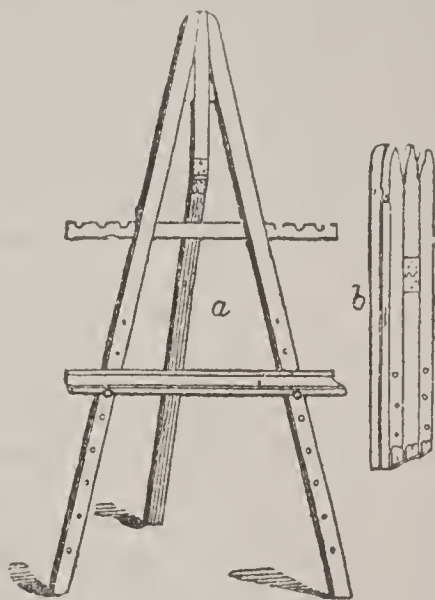
## EASE—EASEMENT.

**EASE**, n. *ēz* [F. *aise*, satisfaction, ease—from mid. L. *asa*, a handle, convenience: It. *asio*; Port. *azo*, convenience, leisure: Gael. *athais*, ease]: rest from labor; freedom from pain, want, or anxiety; freedom from difficulty; freedom from constraint or formality: V. to give relief or rest to; to free from pain; to alleviate. **EASING**, imp. *ē'zing*. **EASED**, pp. *ēzd*. **EASEMENT**, n. *ēz'mēnt*, that which gives ease; convenience; assistance; in *law*, any continuous privilege or convenience connected with land or tenement, which one party possesses of another gratuitously. **EASY**, a. *ē'zī*, free from pain or annoyance; free from anxiety or care; quiet; not difficult or laborious; not rough or uneven; complying; satisfied; comfortable; not stiff or constrained; credulous; in *com.*, not straitened or restricted as regards money; plentifully supplied; opposed to *tight*: AD. without troubling. **EA'SILY**, ad. *-ī*. **EA'SINESS**, n. freedom from difficulty, constraint, or formality. **AT EASE**, without pain or anxiety. **EASEFUL**, a. *ēz'fūl*, peaceable; quiet. **EASY-CHAIR**, an arm chair cushioned all over.—**SYN.** of 'ease, n.': quiet; rest; repose; tranquillity; lightness; readiness; relief; leisure; refreshment; peace;—of 'ease, v.': to relieve; calm; assuage; allay; mitigate; appease; pacify;—of 'easy': secure; tranquil; facile; free; unconstrained; smooth; yielding; ready.

**EASEL**, n. *ē'zəl* [Ger. *esel*, an ass, an easel]: frame for supporting a painter's canvas or panel at the proper height and angle.

**EASEMENT**, in Law: defined as 'a privilege without profit, which the owner of one neighboring tenement hath of another, existing in respect of their several tenements, by which the servient owner is obliged "to suffer or not to do" something on his own land for the advantage of a dominant owner.'—Gale on *Easements*. The rights comprehended under the term E. are very important; they include rights of water, rights of way, rights to light and air, rights to support from a neighboring soil or house, rights to carry on an

offensive trade, etc. An easement is an 'incorporeal hereditament (q.v.), and corresponds in many respects with a servitude (q.v.) in Scotch law, but carrying no title to the profit of the soil. An E. cannot exist apart from an estate in land, it being necessary that there should be two tenements, the one enjoying the right (dominant), the other over which it is enjoyed (servient). An E. must be constituted by deed or by prescription (q.v.). It may be extinguished by an actual



Easel:

Of modern construction.

a, easel open for use; b, easel folded up.

## EAST.

or implied release. When a party entitled to the enjoyment of an E. is disturbed in that enjoyment, he may enforce his right by action at law, or he may enter upon the servient tenement, and abate the nuisance himself. The law of E. in the United States is regulated by the same principles that prevail in England: see Kent's *Commentaries on American Law*.

EAST, n. *ēst* [Ger. *ost*; Icel. *austr*; Dut. *oost*, the east; Esthon. *ea*, ice, *east*, from the ice, also the icy wind]: that part of the heavens where the sun rises; the eastern parts of the earth: ADJ. toward the rising sun. EAST'ERLY, a. *-ēr-lī*, coming from the east; situated toward the east; looking toward the east: AD. in the direction of east. EAST'ERN, a. *-ēr-n*, situated or going toward the east; living or dwelling in the direction of the east; oriental. EAST'ERLING, n. the native of a country eastward of another. EAST'ING, n. among *seamen*, the distance a ship makes good in an east direction. THE EAST, eastern regions; Asiatic countries. EAST'WARD, ad. *-wērd*, or EAST'WARDS [A.S. *weard*, situation, direction]: toward the east. THE EASTWARD, n. the direction toward the east.

EAST: vaguely speaking, that quarter of the horizon where the sun rises, or which a person with his face to the south has on his left hand. It is only at the equinoxes that the sun rises exactly in the east point. A line at right angles to the meridian of a place, points exactly east and west: see MERIDIAN and HORIZON.

From very early times, the east has been invested with a certain sacred character, or at least held in respect over other points of the compass. It was the practice of the ancient pagans to fix their altars in the eastern part of their temples, so that they might sacrifice toward the rising sun, which in itself was an object of worship. The custom of venerating the east was perpetuated by the early Christian church from various records in the Scriptures: for instance: 'The glory of the God of Israel came from the way of the east,' Ezek. xliii. 2: 'There came wise men from the east to Jerusalem,' Matt. ii. 1: 'And, lo, the star, which they saw in the east, went before them,' Matt. ii. 9. These passages attribute no sacredness to the east, yet the incidents which they recorded supplied material for reverence which tradition gradually heightened. Thus, it was said that Christ had been placed in the tomb with his feet toward the east, and that at the day of judgment he should come from the eastward in the heavens. Looking toward the sun in the east in praying or repeating the creed, was thought to put worshippers in remembrance that Christ is the sun of righteousness, and such an attitude was accordingly adopted as an aid to devotion. From these various circumstances, the building of churches with the chancel (q. v.) to the east (see ORIENTATION), bowing to the east on uttering the name of Jesus, and burying with the feet to the east, were introduced as customs in the church. In recent times there has been a general disregard to the practice of turning formally with the face to the east on repeating the



## EASTBOURNE—EAST CAPE.

creed, and, as is well known, the attempt to revive it by a party in the English church has caused considerable opposition. It is a curious instance of the inveteracy of popular custom, that in Scotland, where everything that savoured of ancient usage was set aside as popish by the reformers, the practice of burying with the feet to the east was maintained in the old churchyards, nor is it uncommon still to set down churches with a scrupulous regard to east and west. In modern cemeteries in England and Scotland, no attention appears to be paid to the old punctilio of interring with the feet to the east, the nature of the ground alone being considered in the disposition of graves.

**EASTBOURNE**, *ēst'bŭrn*: fashionable watering-place in the s.e. of Sussex, England. It lies to the west of Pevensey Bay and is  $2\frac{1}{2}$  m. s.s.e. of Beach Head (q.v.). In the vicinity are fine drives and walks; and the town has several theatres and libraries. Devonshire park and pavilion, promoted as places of public entertainment, are of great beauty. The churches are very fine. Remains of a Roman villa, bath, and tessellated pavements have been found here. E. is one of the leading educational centres on the s. coast of England. Pop. of parish (1891) 34,977.

**EAST CAPE**: most easterly headlands of the island of Madagascar, of the n. island of New Zealand, and of Siberia or Asiatic Russia. The *first* (in Madagascar) is in lat.  $15^{\circ} 20'$  s., and long.  $50^{\circ} 15'$  e.; the *second* (in New Zealand) in lat.  $37^{\circ} 40'$  s., and long.  $178^{\circ} 40'$  e., being almost precisely the antipodes of Carthagenā in Spain; and the *third* (in Siberia) is that extremity of the Old World which is nearest to the New, being separated by Behring's Strait (q.v.) from Cape Prince of Wales in America: it is in lat.  $66^{\circ} 6'$  n., and long.  $169^{\circ} 38'$  w.; or rather, to follow the natural reckoning,  $190^{\circ} 22'$  e.

## EASTER.

EASTER, n. *ēs'tēr* [AS. *Eoster*, Easter—from *Eostra*, the goddess of spring, or of the rising day, whose festival was held in April: Icel. *ast*, love; the old name was *Pasch* (q.v.) from Gr. *pascha*, the passover]: the festival of the resurrection of Jesus Christ, not traceable to the times of the apostles; but evidently of very ancient origin in the early church as taking the place of the Jewish passover, with whose date it was deemed nearly to coincide. In the ancient church, the celebration of Easter lasted eight days. After the 11th c., however, it was limited to three, and in later times, generally to two days. It was formerly the favorite time for the rite of baptism. The courts of justice were closed, and alms dispensed to the poor and needy, who were even feasted in the churches—a custom which led to much disorder. Slaves also received their freedom at that season; and as the austerities of Lent were over, the people gave themselves up to enjoyment; hence the day was called the 'Sunday of joy' (*Dominica gaudii*). To the popular sports and dances were added farcical exhibitions, in which even the clergy joined in some places, reciting from the pulpits stories and legends, with a view to stir the hearers to laughter (*risus paschalis*). Against this indecency, the Reformers of the 16th c. loudly and successfully raised their voices. During the whole week before Easter—that is, in the interval between Palm Sunday and the beginning of the Easter festival—daily services were held. See GOOD FRIDAY: HOLY WEEK: PASSION WEEK.

On Easter day, the people saluted each other with the Easter kiss, and the exclamation *Surrexit* (He is risen); to which the reply was *Vere surrexit* (He is risen indeed). The chief solemnity always consisted of the celebration of the Lord's Supper.

The proper time for the celebration of Easter has occasioned no little controversy. In the 2d c., a dispute arose on this point between the Eastern and Western churches. The great mass of the Eastern Christians celebrated Easter on the 14th day of the first Jewish month or moon, considering it to be the successor and the equivalent to the Jewish Passover. The Western churches celebrated it on the Sunday after the 14th day, holding that it was the commemoration of the resurrection of Jesus. The Council of Nice (325) decided in favor of the Western usage, branding the eastern usage with the name of the 'quartodeciman' heresy. This, however, settled only the point that Easter was to be held, not upon a certain day of the month or moon, but on a Sunday. The proper astronomical cycle for calculating the occurrence of the Easter moon was not determined by this council. It appears, however, that the Metonic Cycle (q.v.) was already in use in the West for this purpose; and it was on this cycle that the Gregorian Calendar, introduced 1582, was arranged. The method on which this calendar is constructed is too complex for description here: see an elaborate account of the whole matter by Prof. De Morgan in the *Companion to the British Almanac* 1845. The time of Easter—that being



# EASTER.

the most ancient and important of all the movable feasts of the Christian Church—determines all the rest. It was debated, at the time of the introduction of the Gregorian Calendar, whether Easter should continue to be movable, or whether a fixed Sunday, after Mar. 21, should not be adopted. It was deference to ancient custom that led the ecclesiastical authorities to adhere to the method of determination by the moon. It must be remembered, however, that it is not the actual moon in the heavens, nor even the mean moon of astronomers, that regulates the time of Easter, but an altogether imaginary moon, whose periods are so contrived that the new (calendar) moon always follows the real new moon (sometimes by two, or even three days). The effect of this is, that the 14th of the calendar moon—which had, from the times of Moses, been considered ‘full moon’ for ecclesiastical purposes—falls generally on the 15th or 16th of the real moon, and thus after the real full moon, which is generally on the 14th or 15th day. With this explanation, then, of what is meant by ‘full moon,’ viz., that it is the 14th day of the calendar moon, the rule is, that Easter Day is always the first Sunday after the paschal full moon, i.e., after the full moon which happens upon or next after Mar. 21 (the beginning of the ecclesiastical year); and if the full moon happens upon a Sunday, Easter Day is the Sunday after. For any given year, the day on which the paschal full moon falls, and then Easter Day, are found by the following table and rule—

Days of the Month.	Dom. Letter.	Golden Number.	Days of the Month.	Dom. Letter.	Golden Number.
March 21	C	14	April 8	G	..
“ 22	D	3	“ 9	A	15
“ 23	E	..	“ 10	B	4
“ 24	F	11	“ 11	C	..
“ 25	G	..	“ 12	D	12
“ 26	A	19	“ 13	E	1
“ 27	B	8	“ 14	F	..
“ 28	C	..	“ 15	G	9
“ 29	D	16	“ 16	A	..
“ 30	E	5	“ 17	B	17
“ 31	F	..	“ 18	C	6
April 1	G	13	“ 19	D	..
“ 2	A	2	“ 20	E	..
“ 3	B	..	“ 21	F	..
“ 4	C	10	“ 22	G	..
“ 5	D	..	“ 23	A	..
“ 6	E	18	“ 24	B	..
“ 7	F	7	“ 25	C	..

First ascertain the Dominical Letter (see under DOMINICAL) taking the second, where there are two—and the Golden Number (see EPACT); look for the golden number in the third column of the table, and opposite to it stands the day of the full moon; then look for the dominical letter, next after the day of full moon, and the day standing opposite the dominical letter is Easter Day. It sometimes

## EASTER.

happens that Easter Day, as thus determined, is different from what it would be if by 'full moon' were understood the astronomical full moon. Thus, in 1818, Easter day, by the calendar, fell, and was celebrated on Mar. 22, the earliest possible day, though the full moon was on that day; and in 1845, it again fell on the day of the actual full moon (Mar. 23).

From 1889 to the end of the present century, Easter will occur on the dates following:

1889, Apr. 21	1893, Apr. 2	1897, Apr. 18
1890, Apr. 6	1894, Mar. 25	1898, Apr. 10
1891, Mar. 29	1895, Apr. 14	1899, Apr. 2
1892, Apr. 17	1896, Apr. 5	1900, Apr. 15

*Good Friday* is the Friday before Easter; *Ascension Day* is Thursday the 40th day after Easter; *Whitsunday*, or the *Pentecost Day* is the 50th day after Easter, i.e. the Sunday 7th after Easter.

One object in arranging the calendar moon was, that Easter might never fall on the same day as the Jewish Passover. They did occur together, however, in 1805, Apr. 14; and in 1825, Apr. 3; and will do so again in 1903, Apr. 12; in 1923, Apr. 1; in 1927, Apr. 17; and in 1981, Apr. 19. The Jewish festival usually occurs in Passion week, and never before Mar. 26, or after Apr. 25 (new style). On the other hand, the Christian festival is never before Mar. 22, or after Apr. 25. In 1761 and 1818, Easter fell on Mar. 22; but neither in this nor the following century will this date for it recur. In 1913, it will fall on Mar. 23, as it did in 1845 and 1856. The latest Easters in this century and the following, occur in 1886 and 1943, on Apr. 25. In 1848, Easter fell on Apr. 23; and in 1859, on Apr. 24.

*Popular Observances.*—Many of the popular observances connected with Easter are clearly of pagan origin. The goddess Ostara or Eastre seems to have been the personification of the morning or east (q.v.), and also of the opening year or spring. The Anglo-Saxon name of April was Estormonath; and it is still known in Germany as Ostermonath. The worship of this being seems to have struck deep root in n. Germany, and was brought into England by the Saxons. It continued to be celebrated in many parts in n. Germany till the beginning of the present century, by the kindling of bonfires and numerous other rites: see BELTEIN. Like the May observances of England, it was especially a festival of joy. It was the usual policy of the ancient church, seeking to convert surrounding pagans, to endeavor to give a Christian significance to such of the rites as could not be rooted out; and in this case, the conversion was particularly easy. Joy at the rising of the natural sun, and at the awaking of nature from the death of winter, became joy at the rising of the Sun of Righteousness—at the resurrection of Christ from the grave. The bonfires can be traced in the great 'paschal tapers,' sometimes weighing 300 lbs., with which the churches were lighted on Easter Eve. In the ancient church dis-



## EASTER ISLAND—EASTERN CHURCHES.

bursements of St. Mary-at-Hill, in the city of London, there is even an entry 'For a quarter of coles for the hal-  
lowed fire on Easter Eve. 6d.'

The most characteristic Easter rite, and the one most widely diffused, is the use of *Pasch* (i.e., Easter) *eggs*. They are usually stained of various colors with dye-woods or herbs, and people reciprocally make presents of them; sometimes they are kept as amulets, sometimes eaten; games also are played by striking them against one another. In some moorland parts of Scotland, it used to be the custom for young people to go out early on 'Pasch Sunday' and search for wild-fowls' eggs for breakfast, and it was thought lucky to find them. There can be little doubt that the use of eggs at this season was originally symbolical of the revivification of nature—the springing forth of life in spring. The practice is not confined to Christians; the Jews used eggs in the feast of the Passover; and we are told that the Persians, when they keep the festival of the solar new year (in March), reciprocally present each other with colored eggs.

From the Christian point of view, this 'Feast of Eggs' has been usually considered as emblematic of the resurrection and of a future life.

**EASTER ISLAND**, originally **DAVIS'S LAND**: detached spot of land on the Pacific, lat.  $27^{\circ} 10' \text{ s}$ , and long.  $109^{\circ} 26' \text{ w}$ . It is of volcanic origin, rising 1,200 ft. above the sea; and it is moderately fertile, but almost destitute of water. It belongs to the Polynesian archipelago, of which it forms the e. extremity. On this island, of 30 m. circumference, now inhabited by about 150 wretched savages, there exist multitudes of rude stone statues, some of colossal size, and standing on long platforms of Cyclopean masonry. The present inhabitants, whose language is radically the same as that of Tahiti, have no tradition of the race that made them. The existence of these sculptures is thought to strengthen the conclusion, arrived at on other grounds, that the Polynesian islands are relics of a submerged continent.

**EASTER MONDAY**: in *chh. cal.*, the day after Easter Sunday. In England it has long been the first great popular festival of the year. In 1871, it was made a bank holiday.

**EASTERN ARCHIPELAGO**: see **MALAY ARCHIPELAGO**.

**EASTERN CHURCHES**: name applied to several divisions of bodies of Christians, comprising the *Orthodox Greek Church*, with 10 independent organizations, and about 98,016,000 adherents, of whom about 61,940,000 are in Russia (with 1,500,000 dissenters), 7,000,000 in Turkey, 5,250,000 in Roumania, 2,927,000 in Austria-Hungary, 2,200,000 in Greece, 2,007,000 in Bulgaria, 1,939,000 in Servia, and 232,000 in Montenegro; *National Churches*: Abyssinian, 1,250,000, Armenian, 1,140,000, Coptic, 500,000, Jacobite, 350,000, Christians of St. Thomas, in India, 350,000, Nestorian, 250,000, and Maronite, 250,000; and

## EASTERN EMPIRE—EASTERN RITE.

*United Churches*; United Greek, in Austria-Hungary, 4,036,000, in Turkey, 1,000,000, and in Russia 55,000, United Nestorian, in India, 150,000, in Turkey and Persia, 20,000, United Armenian, 100,000, United Jacobite, in India, 160,000, United Abyssinian, 50,000, and United Coptic, 10,000.

**EASTERN EMPIRE:** see **BYZANTINE EMPIRE**.

**EASTERN QUESTION:** question as to the distribution of political power in eastern Europe and the Asiatic continent. The vast relative extent of the Russian empire on the map of Europe, or of the world, and the knowledge that for some generations it has steadily increased, raise the question whether the liberties of Europe and mankind are endangered by the preponderance of the power just mentioned, with its semi-barbarous hordes. The majority of minds, at least in England, France, and Italy, apprehend some danger; and with them the E. Q. is simply this: How is the proper balance of power to be preserved against the menacing progress of Russia toward s. and w. Europe in one direction, and toward India in the other? The British Indian empire is felt to be ultimately at stake. Of old, the stereotyped answer to the inquiry was, By maintaining the integrity of the Ottoman empire. In support of this view the Crimean war was carried on 1854-56, both the great parties of the state in England concurring as to its necessity, the only dissentients being a small minority of the community, led, however, by Cobden, Bright, Milner, Gibson, and others. By the time of the next Russo-Turkish war, 1877-8, many of the liberal party had begun to doubt whether the Crimean war had been just, and whether it had gained any lasting advantage. Their sympathies, alienated from Turkey by what were called the Bulgarian atrocities, were given to the old Christian nationalities, Servians, Greeks, and others, held down by Turkey, and, within certain limits, to Russia as advancing to their deliverance. But their desire is that the emancipated Christians shall shake off Russian influence, and, prizing their personal independence, maintain it, if need be, against the great northern power, and so conduct themselves as to encourage the Great Powers to transfer Constantinople to their keeping if the domination of the Turks in the latter capital should come to an end. The English Conservative party, on the contrary, estimate the long oppressed Christians of the Ottoman empire less, and the Turks more highly, and are prepared to defend, and, if need be, repeat the policy of the Crimean war. Acute crises in the E. Q. have seemed to recur in nearly periodical cycles of 20-25 years.

**EASTERN (or ORIENTAL) RITE:** designation of the rituals of those branches of the Rom. Cath. Church which acknowledge the supremacy of the pope, and are permitted to employ rituals differing in important provisions from that of the strict Latin usage. The branches include many Armenian, Coptic, Greek, and Syrian bodies, who have had rituals of their own from very remote times. The language employed, instead of the Latin, is that of the different nationalities, and the rituals in general permit the



## EAST HUMBOLDT MOUNTAINS.

laity the use of both elements in the Eucharist, and sanction marriage in the subordinate orders of the priesthood.

**EASTERN SHORE:** in general the entire peninsula lying between Delaware Bay and the Atlantic Ocean; and Chesapeake Bay, comprising all of Del. and portions of Md. and Va.; but more particularly the portions of Md. and Va. e. of Chesapeake Bay. It formerly contained the most exclusive and aristocratic settlements in the southern states, but now has a large industrial and commercial importance. The climate is very mild; its waters abound in wild fowl; and there are extensive mines of bog-iron ore, valuable deposits of kaolin, and large tracts of choice oak forests. Oyster-dredging, peach-growing, market-gardening, and the fisheries are the chief industries.

**EASTER OFFERINGS, or EASTER DUES:** in England, small sums paid to the parochial clergy by their parishioners at Easter, as a compensation for personal tithes, or the tithe for personal labor.

**EASTER TERM, LEGAL:** term of sittings of English courts, now extending from Apr. 15 to May 8, with slight variations in some years to avoid sittings on days too near Easter: see **LAW TERMS**.

**EASTHAMPTON**, *ĕst-hămp'ton*: town, Hampshire co., Mass.; on the Conn. river and the New Haven and Northampton railroads; 5 m. s.w. of Northampton, 17 m. n.n.w. of Springfield, 71 m. n.w. of New Haven. It contains 1 national bank, cap. \$200,000, surplus (1888), \$60,000; 1 savings bank, the Williston Seminary for young men—a well-endowed institution of high rank—a public library, 4 churches, and manufactures of vulcanized rubber, buttons, pumps, suspenders, thread and cotton yarn, and machinery. Pop. E. H. tp. (1885) 4,291; (1900) 5,603.

**EAST HAMPTON:** summer resort, in E. H. tp., Suffolk co. N. Y.; 1 m. from Atlantic ocean, 7 m. s.e. of Sag Harbor, on the Long Island railroad. The tp. comprises the e. end of Long Island, and at the extremity is Montauk Point, on which is a noted lighthouse. Fruits and vegetables thrive in the w. portion and excellent pasturages are found in the east. The salubrity of the climate makes it popular as a resort in summer, and the multitude of its wild fowl attract sportsmen in autumn. The village contains 2 churches and an academy. Pop. tp. (1875) 2,299; (1880) 2,303; (1890) 2,431; (1900) 3,740.

**EAST HARTFORD:** town, Chatham tp., Hartford co., Conn., on the New York and New England railroad, 2 m. from Hartford, of which it is an important suburb, and 33 m. from New Haven. Its industries include a paper mill, carriage factories, and other important manufactures. It has a graded school and other public buildings, and 2 weekly newspapers. Pop. (1880) 1,235; (1890) 4,455; (1900) 6,406.

**EAST HUMBOLDT MOUNTAINS**, *ĕst hūm'bōlt*: range in the s. part of Elko co., Nev.; extends n. and s.; is pierced by Fremont pass and Secret valley; has Ruby valley on the

## EAST INDIA ARMY.

e., and Huntingdon valley on the w.; contains two lakes, Franklin and Ruby, fed by springs; has several peaks exceeding 12,000 ft. in height; and has valuable forests of pine and fir.

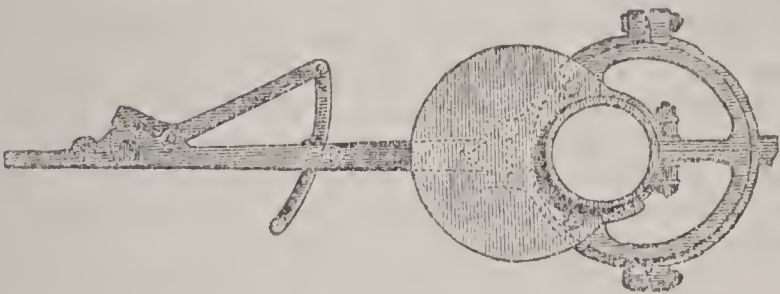
**EAST INDIA ARMY:** military force in the service of the E. India Company (q. v.). When the E. India Company first sent factors or agents to India, an army was not thought of. Military forces arose out of the exigencies of the times. Some of the first troops in the company's pay were mere adventurers; some were liberated convicts; some deserters from European armies. Gradually, organization was introduced, and improved arms furnished. As the power of the Company increased, natives entered the battalions; until at length most of the troops were Hindus or Mohammedans, drilled by non-commissioned officers sent out from England. A few regiments were raised in England; a much larger number were raised in India; but all alike were officered by the Company's favored English officers, largely paid, and having many opportunities for making rapid fortunes. The ranks were filled by enlistment on most liberal terms, never by compulsion of the natives. Immediately previous to the revolt in 1857, the army in the pay of the Company comprised about 24,000 royal troops (lent to, and paid by the Company); 18,000 European troops, raised and drilled by the Company in England; 180,000 native regulars; and 60,000 native irregulars horse—about 280,000 in all. There were also 40,000 contingents furnished by dependent native princes, and native armies of the independent and semi-dependent princes. The Company's troops formed three distinct armies, each under its own commander-in-chief, and each stationed in one particular presidency. In these three armies (Bengal, Madras, Bombay) three kinds of troops—Europeans, native regulars, and native irregulars—had their own special organization. For the extent to which this fine army melted away 1857-59, see INDIA. It was in the Bengal army that the disruption chiefly occurred. The irregulars, cavalry and infantry, raised among the Sikhs and Punjabees, were in almost every case faithful.

In 1858, Aug., the act which transferred the govt. of India from the Company to the crown received the royal assent: the army was transferred as well as the political power. In 1861, an act was passed reorganizing the Indian army—under which the *British* portion formed part of the queen's army generally, with certain honorary distinctions, took its turn at service at home and in the colonies, and was paid out of Indian, not imperial revenues. The *native* portion was managed wholly in India. In 1895 the army was again reorganized, the troops of the three presidencies being divided into four commands as army corps, viz.: those of Madras, Bombay, and East and West Bengal. Reports showed 77,258 English officers and men, 148,000 native officers and men, and 30,000 enrolled volunteers.

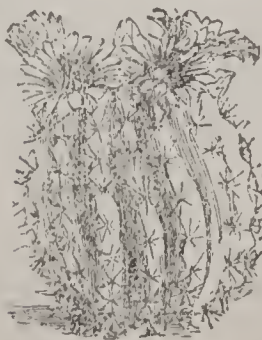




Stone Statues on the side of the Volcano Ronororaka, Easter Island.



**Eccentric.**



Variegated-flowered Echinocactus (*E. centeterius*).

## EAST INDIA COMPANY.

**EAST INDIA COMPANY:** incorporated company of English merchants, formed to carry on trade with the E. Indies. A charter was granted by Queen Elizabeth, 1600, Dec. 31, to a number of London merchants, under the title of 'The Governor and Company of Merchants of London trading to the East Indies.' From the time when Vasco de Gama effected the eastern passage to India, by doubling the Cape of Good Hope, 1479, the Portuguese carried on an extensive trade with that country, unaffected by rivals until nearly a century afterward, when the Dutch and the English began to compete with them. This competition became formidable when two 'East India Companies' were established, one at Amsterdam, and one in London. It is of the latter of these that we here treat. The charter was exclusive, as is usual in such cases; prohibiting the rest of the community from trading within the limits assigned to the Company. Those limits were enormous, comprising the whole space, land and sea, from the Cape of Good Hope eastward to Cape Horn—i.e. the whole of the Indian and Pacific Oceans. The charter was for 15 years. The Company speedily sent out ships to Java and Sumatra, which returned with calicoes, silk, indigo, and spices. It was then determined to make some kind of settlements on the coast of Hindustan itself; and about 1612, the Company obtained permission from the native princes to establish factories or agencies at Surat, Ahmedabad, Cambay, and Gogo.

The Company's charter was renewed from time to time, with various modifications, but not without much contention and difficulty. Gradually establishments were formed in Java, Sumatra, Borneo, Celebes, Malacca, Siam, the Banda Islands, and other places in the East; as well as on the Coromandel and Malabar coasts of India itself. The beginning of Madras dates 1640, of Calcutta 1645, and Bombay 1665, as chief establishments of the Company. In 1662, Charles II. gave them permission 'to make war and peace on the native princes'—a privilege of which they largely availed themselves for nearly 200 years.

In 1698, the crown granted a charter to a *new* E. I. C., which offered a loan of £2,000,000 to the state; but this naturally led to wranglings, and the two companies were united by an act of parliament 1702. The constitution then established was maintained with little alteration as long as the Company existed. Every shareholder who held £500 of the Company's stock became a member of the court of proprietors; and this court had legislative functions in all that related to the Company's affairs. The proprietors annually chose 24 to form a court of directors, from those of their number who held not less than £2,000 of stock. Six of the directors went out of office every year; they retired in rotation, so that each had four years of office. It was a general custom with the proprietors to elect the same persons as directors over and over again. The court of proprietors was to meet once a year, or oftener if necessary; the court of directors as often as the directors chose, provided 13 were present. Theoretically,



## EAST INDIA COMPANY.

the constitution of the Company was very democratic; but practically the affairs were in the hands of the directors; for the proprietors took little other interest than in receiving their half-yearly dividends. The proprietors had from one to four votes each, according to the amount of stock held by them. The board of control, of later formation, bore relation to the governmental affairs of India.

Properly speaking, the Company were only merchants: sending out bullion, lead, quicksilver, woolens, hardware, and other goods to India; and bringing thence calicoes, silk, diamonds, tea, porcelain, pepper, drugs, saltpetre, etc. Not merely with India, but with China and other parts of the East, the trade was monopolized by the Company; and hence arose their great trade in China tea, porcelain, and silk. By degrees, avarice and ambition led the Company, or their agents in India, to take part in the quarrels among the native princes; this course gave them power and influence at the native courts, whence arose the acquisition of sovereign powers over vast regions. India thus became valued by the Company, not only as commercially profitable, but as affording to the friends and relations of the directors opportunities of making vast fortunes by political or military enterprises. For the political affairs of the Company, and the rise of a British empire in India, see INDIA, BRITISH; it will suffice here merely to state, that no *national* or *patriotic* motive marked the beginning of this course.

In 1744, the Company obtained a renewal of their charter till 1780, but not without a loan of £1,000,000 to government; for the monopoly was distasteful to the nation at large. France, too, had an E. I. C., and the struggles between the two companies for power in southern India, led to constant warfare between them during the remainder of the century. Other loans to government were the means of obtaining further renewals of the charter in later years. In 1833, the legislature took away all the *trading* privileges of the company. The dividends to proprietors of East India stock were thenceforward to be paid out of taxes imposed by the company on the people of India, in such provinces as were under British dominion. From that year the company's powers became anomalous; the company could not *trade*, and could not *govern* without the sanction and continued interference of the imperial government. The wars in India, since that year, have been waged by England as a nation, rather than by the company; and England practically, though not nominally, became responsible for the enormous cost of those wars. In 1853, the charter was again renewed, with a further lessening of the power of the company. and an increase of that of the crown.

Had not the Indian revolt occurred in 1857, the last charter would have remained in force until 1873; but that gigantic calamity led to the resolution—a resolution the wisdom of which was disputed by many of the best judges of Indian affairs—to concentrate the power in the hands of the imperial

## EAST INDIA FLY—EASTLAKE.

government. In spite of a strenuous resistance, in 1858, the company were forced to cede their powers, by an act which received the royal assent Aug. 2. The charter of 1853 had provided that £6,000,000 of India stock should have 10½ per cent. dividend *guaranteed* by England out of the revenues of India; and that parliament should redeem this stock at cent. per cent. premium any time after the year 1873. The act of 1858, therefore, contained due clauses for carrying out these provisions, and transferred the whole of the company's powers to the crown.

The company continued to exist, but for little other purpose than that of receiving and distributing dividends. Most of the distinguished men, military and political, till then in the company's service, accepted office under the crown, to assist the government by their general knowledge of Indian affairs. These affairs are now managed by a sec. of state for India at the new India Office. The valuable library and museum of the company have passed over to the crown; and an act of parliament (1873) provides for the paying off of the India stock, and the final extinction of the once famous East India Company.

EAST INDIA FLY: in *phar.*, an East Indian species of cantharis or blister beetle, larger and more powerful in its action than the ordinary Spanish fly.

EAST INDIES: as distinguished from *West Indies*; region including not merely the two great peninsulas of s. Asia, but likewise all the adjacent islands from the delta of the Indus to the n. extremity of the Philippines. They thus extend, to use round numbers, in latitude from 35° n. to 10° s., and in e. long. from 65° to 130°. At one time, the name of India had toward the east a still wider application, occasionally comprising Japan, nay, everything in that direction except China alone. See INDIA.

EAST INSULAR, a.: in *geog.*, pertaining or relating to the islands of the Eastern or Malay archipelago.

EASTLAKE, *ēs't'lāk*, Sir CHARLES LOCK: 1795–1865; b. Plymouth, England: pres. of the Royal Acad. of London. He was educated at the Charter-house in London, and entered as a student at the Royal Academy. Subsequently, he went to Paris, where he studied and copied the great paintings then collected in the Louvre. The return of Napoleon from Elba compelled him to leave France. He went back to his native town, and supported himself by portrait-painting. When the *Bellerophon*, with Napoleon on board, appeared in the port of Plymouth, E. profited by the opportunity, and produced his first important picture, *Napoleon at the Gangway of the Bellerophon, attended by some of his Officers*. In 1817, Sir Charles visited Italy and Greece, sketching assiduously in both countries. During a residence of several years in Rome, he executed his *Girl of Albano leading a Blind Woman to Mass*, *Isidas the Spartan*, *Pilgrims arriving in Sight of Rome*, and many others, illustrative of Italian customs and scenery. In 1827 he was elected an associate, and 1830 a full member of the Royal Academy. His *Greek Fugitives Prisoners to Banditti*, etc., added



## EAST LIVERPOOL—EASTON.

to his already great reputation; and in 1841 appeared what many deem his masterpiece, *Christ lamenting over Jerusalem*. It was immensely admired, the duplicate painted for Mr. Vernon being reckoned one of the most valuable pictures in the Vernon Gallery. *Hugar and Ishmael* was exhibited 1844; *Heloise* 1845; *The Escape of Francesco Novello di Carrara with Taddea d'Este, his Wife, from the Duke of Milan*, 1850; *Beatrice* 1855, etc. In 1850, he was elected pres. of the Royal Acad., at which time he received the honor of knighthood. Subsequently, he was appointed director of the National Gallery. Sir Charles also acquired high reputation as a writer on art. In 1847, he published *Materials for the History of Oil Painting*, a work of great learning and research. He contributed several articles to the *Penny Cyclopædia* on subjects belonging to his profession, and executed a translation of Goethe's *Farbenlehre*. In 1853, he received the title D.C.L. from the Univ. of Oxford. LADY EASTLAKE (born Elizabeth Rigby), wife of Sir Charles, is an artist of no little power, and has distinguished herself as an authoress by her *Letters from the Baltic, Livonian Tales*, and her articles on subjects connected with art in the *Quarterly Review*.

EAST LIVERPOOL, *est liv'ér pól*: city in Columbiana co., O.; on the Cleveland and Pittsburg railroad and the O. river; 4 m. n.e. of Wellesville, 24 m. n. of Steubenville, 44 m. w.n.w. of Pittsburg. It has 2 national banks, cap. \$200,000, surplus \$54,000, 6 churches, large public school building, 16 potteries producing granite and yellow wares, and terra-cotta, and several machine shops. Pop. (1870) 2,105; (1880) 5,568; (1890) 10,956; (1900) 16,485.

EAST MAIN: formerly a portion of the Hudson Bay Territories, now incorporated in the Dominion of Canada; bounded n. by Hudson's Strait, and w. by Hudson's Bay down to its s. extremity, meeting Labrador on the e., and Canada on the s. This immense region, thrice as large as Great Britain, is generally bleak and sterile, yielding little to commerce but fish-oil and a few furs.

EAST MAIN: river, otherwise called the *Slade*, crosses the s. portion of the territory known as East Main, entering Hudson's Bay, here known as James's Bay, about lat. 52° 15' n., after a course of 400 miles.

EAST NEW YORK: formerly a village of New Lots tp., Kings co., N. Y., but since 1886 a portion of the 26th ward of the city of Brooklyn; 5 m. s.e. of New York; on the Brooklyn Central Branch and the Manhattan Beach railroads. It has extensive manufactures of boots and shoes, contains 10 churches, 1 savings bank, attractive town hall, and brush, firework, and lead pencil factories. With Brooklyn it became a part of Greater New York, 1898.

EASTON, *est'on*: city, Northampton co., Pa., 54 m. n. of Philadelphia; between the rivers Delaware on the e. and Lehigh on the w., and immediately above their confluence, about 20 m. above the head of navigation on the united streams. Though the place is thus far cut off from the sea, yet, for internal trade, it occupies a commanding position.

## EASTON—EAST ORANGE.

Its natural advantages, too, have been largely improved. Beside railways, E. is the common terminus of three canals—one of 60 m., down on the right side of the Delaware as far as Bristol; another of 84 m., along the Lehigh, into the great coal field of the state; and the third of 102 m., leading across the country to Jersey City. Within the immediate neighborhood, likewise, iron ore and limestone abound. Having an unlimited supply of water-power, the town has various and extensive manufactories. E. was laid out 1738, incorporated 1789. It is the seat of Lafayette College (Presb.), founded 1832. On the opposite side of the Lehigh is So. Easton (q.v.). Pop. (1880) 11,924; (1900) 25,238.

EASTON, *est'on*, JAMES: b. Hartford, Conn.: soldier of the revolution. He learned the builder's trade, and after working some time in Litchfield, Conn., removed to Pittsfield, Mass., 1763; raised a regt. for the revolutionary army in Berkshire, 1775; commanded it at Ticonderoga; conveyed the news of that battle to the provincial congress; advocated the invasion of Canada and commanded a regt. there under Gen. Montgomery till 1776; and then, after spending his whole fortune in the service and receiving the thanks of congress for his active patriotism, was forced by the jealousy of Benedict Arnold to resign from the army. He returned to Pittsfield broken-hearted and died in extreme poverty.

EASTON, NICHOLAS: 1593-1675, Aug. 15; b. Wales; pioneer. He emigrated to Mass. with his two sons 1634, settled at Ipswich, became one of the first settlers of Newbury, Mass., and Hampton, N. H., removed to R. I. and erected the first dwelling in Newport 1638, and was gov. of the provinces of R. I. and Providence 1650-52. One of his sons, JOHN, wrote a *Narrative of the Causes which led to Philip's Indian War*—and was gov. of R. I. 1690-95.

EAST ORANGE: city of Essex co., N. J.; on the Del., Lack. and West. railroad, and a branch of the Erie railroad, also on the Newark and Orange street railway; 3 m. w.n.w. of Newark, 12 m. w. of New York. It is on the e. boundary of the city of Orange and has an area about double that of the city. Its streets are broad, straight, and bordered with handsome shade trees. More than 60 miles of well-kept macadam and Telford roads traverse the city and afford delightful drives of many miles. The city is almost wholly a place of permanent and summer residence, and being a favorite with people of wealth, its buildings present a rich variety of architectural fancies. The residences are in general surrounded with spacious grounds, and there are many fine specimens of landscape gardening. E. O. is lighted with gas and electricity, supplied with adequate water and sewage systems, became a city in 1899, and contains 3 commodious brick public school-buildings, 9 churches, divided denominationally as follows: 3 Presb., 3 Meth. Episc., 2 Prot. Episc., 2 Congl., 1 Bapt., 1 Ref., 1 Rom. Cath. It has 1 national, 1 state bank, and 1 weekly newspaper. Its healthful and pleasant location near the foot of the Orange



## EASTPORT—EAST SAGINAW.

Mountains, its freedom from the nuisances of city life, and its accessibility from N. Y., have given it a rapid growth. Pop. (1880) 8,349; (1890) 13,282; (1900) 21,506.

**EASTPORT**, *ēst'pōrt*: city, Washington co., Me.; on one of the small islands of Passamaquoddy Bay, which receives the St. Croix, the international boundary during its whole course between the United States and British America. On the coast, therefore, E. is the frontier town of the Union toward the north-east. Its harbor is deep enough for the largest vessels. The tide rises within it to a height of 25 ft.—a height far exceeded in many other parts of the Bay of Fundy, of which Passamaquoddy Bay is an inlet. The place is largely engaged in the fisheries and in ship-building. Pop. (1870) 3,738; (1880) 4,006; (1900) 5,311.

**EAST PROVIDENCE**: tp. of Providence co., R. I.; on the Providence Warren and Bristol, and a branch of the Boston and Providence railroads; bounded w. by the Pawtucket river and Narraganset Bay, and separated from the city of Providence by the Blackstone river. It contains the villages of Watchemoket and Rumford, 7 churches, large chemical works, and a post-office at Rumford. Pop. (1880) 4,999; (1890) 8,422; (1900) 12,138.

**EAST RIVER**: strait connecting Long Island Sound and New York Harbor. It is 20 m. long, separating New York City on the west from Astoria, Long Island City and Brooklyn, on the east. Its narrowest part is known as Hellgate (q.v.), in the e. part of its course. Here the rocks, which once obstructed the passage, and vexed the swift current at certain times of tide into dangerous whirlpools and eddies, have been removed by blasting. The name E. R.—clearly a misnomer for an arm of the sea—is convenient as contrasted with the North River, or Hudson, and may have arisen from the river-like action of the tides—an action so powerful as to have here and there materially deepened the channel.

## EAST ST. LOUIS—EATON.

**EAST ST. LOUIS:** city of St. Clair co., Ill.; on the Mississippi river; opp. St. Louis, Mo., with which it is connected by the great steel bridge built by Capt. John B. Eads; terminus of 18 great lines of railroad. It contains the largest stock-yards in the United States, a rolling-mill, car, nail, and soda factories, gas works, and a brewery; 6 churches; public library, high school, St. Aloysius (Rom. Cath.) College, a Rom. Cath. acad., Bapt. college; 2 nat., 1 state, 1 private bank, the Nat. Stockyard Ex., and 2 weekly newspapers. Pop. (1890) 15,169; (1900) 29,655.

**EASY**, etc.: see under **EASE**.

**EAT**, v. *ēt* [Dut. *eten*; Icel. *eta*; Goth. *itan*; Ger. *essen*; L. *edĕrĕ*, to eat; Gael. *ith*, to eat]: to consume, as food with the mouth; to wear away or corrode; to gnaw; to take food. **EAT'ING**, imp.: N. the act of chewing and swallowing food. **ATE**, pt. *āt*. **EATEN**, pp. *ēt n*. **EAT'ABLE**, a. *-ā-bl*, that which can be eaten, or is fit for food: N. anything used for food, usually in the plu. **EAT'ER**, n. one who. **EAT'AGE**, n. *-āj* [from *eat*: Fris. *etten*, to pasture]: pasturage, or the catable growth of either grass or corn field—same as *eddish*. **EATING-HOUSE**, a house where ready-dressed provisions are sold. **TO EAT ONE'S WORDS**, to withdraw or retract them.

**EATH**, a. *ēth* [AS. *eath*, easy; Gael. *adh*, prosperity; *athais*, leisure (see **EASE**)]: in *OE.*, easy; not difficult.

**EATON**. *ē'ton*, AMOS BEEBE: 1806, May 12—1877, Feb. 21; b. Catskill, N. Y.: soldier. He graduated at the U. S. Milit. Acad. 1826, served in the Seminole Indian war 1837-8, was chief commissary of subsistence of Gen. Taylor's army in the early part of the Mexican war, became brev.maj. for services at Buena Vista, was chief commissary of the dept. of the Pacific 1851-55, and at New York 1855-61, depot purchasing commissary in New York 1861-64, and commissary gen. of the subsistence bureau at Washington 1864-74. He rose to the rank of brev.maj.-gen. U.S.A. 1865, and was retired 1874, May.

**EATON**, DANIEL CADY: 1834, Sep. 12—1895, June 29, botanist: b. Fort Gratiot, Mich.; son of Amos Beebe (q.v.). He graduated at Yale 1857, studied botany at Harvard 1860, and was appointed prof. of botany at Yale 1864. He gave special attention to ferns, and published *The Ferns of North America* 1879-80, and numerous other papers on the same subject in *Gray's Manual* and as isolated papers and monographs.

**EATON**, DANIEL CADY: 1837, June 16—; author; b. Johnstown, Fulton co., N. Y.; nephew of Amos Beebe E. (q.v.). His education was received at Yale, where he graduated 1860; and in Europe at the Göttingen gymnasium and the Univ. of Berlin. He was prof. of the history of art at Yale 1869-76. He wrote a *Hand Book of Greek and Roman Sculpture*, and other works. He was author of a criticism of Yale Univ., pub. anonymously 1883.

**EATON**, DORMAN BRIDGMAN, LL.D.: 1823, June 27: 1899, Dec. 24; b. Hardwick, Vt. He graduated from the Univ. of Vt. 1848, and from Harvard Law School with high honors 1850: in the latter year began the practice



## EATON.

of law in New York in partnership with Judge William Kent. He soon became a prominent member of the Union League Club. He travelled in Europe and carefully studied the civil service of the principal nations, was chairman of the civil service commission 1873-75, went to England 1877. was appointed civil service commissioner 1883, resigned 1885, July, but was reappointed in Nov., and resigned 1886. He drafted the laws establishing the police courts and the board of health of New York, and the national Civil Service Act of 1883. He has published *Civil Service in Great Britain*, and various other works.

EATON, EDWARD DWIGHT, D.D., LL.D.: 1851, Jan. 12 —————; educator; b. Lancaster, Wis. He graduated at Beloit Coll., Wis., 1872, at Yale Divinity School 1875, and during the next two years studied in the universities of Leipsic and Heidelberg, Germany. He was duly ordained, and was pastor of Congl. churches at Newton, Io., 1876-80, and at Oak Park, Ill., 1880-86. In 1886-1901 he was pres. of Beloit Coll., Beloit, Wis.

EATON, JOHN, Jr., PH.D., LL.D.: b. Sutton, N. H., 1829, Dec. 5: educator. He graduated at Dartmouth College 1854, taught school in Cleveland, O., 1854-56, was supt. of public schools of Toledo 1856-59, studied theology at Andover Theological Seminary 1859-61, and was ordained by the Maumee (O.) presbytery 1861, Sep. 5. The preceding month he was commissioned chaplain of the 27th O. vols. Soon afterward he was appointed brigade sanitary inspector, supt. of contrabands 1862, Nov., and gen. supt. of freedmen for Miss., Ark., w. Tenn., and n. La. 1862, Dec., and held the latter office till 1865, May 27. During this service he was commissioned col. of the 63d U. S. colored troops 1862, Oct. 2, brevetted brig.gen. of vols. 1865, Mar. 13, and appointed asst. commissioner of the bureau of refugees, freedmen, and abandoned lands 1862, May 27. In 1871-86 he was commissioner of the U. S. Bureau of Education; in 1895 became president of Sheldon Jackson College, Salt Lake City; and in 1898 was made special agent to establish the American system of public education in Porto Rico.

EATON, JOSEPH ORIEL: 1829, Feb. 8—1875, Feb. 7; artist; b. Licking co., Ohio. His merits as a painter, both of portraits and of compositions, caused his election as an associate of the National Acad. of Design; and he was an early member of the Soc. of Painters in Water-colors. Among his landscapes in oil were effective views on the Hudson river; among portraits, that of G. H. Hepworth, D.D.; and of ideal pieces, *The Greek Water Carrier* and the *Lady Godiva*. He excelled in children's portraits. In water-colors he painted *Vision of the Cross*, *Little Nell and Her Grandfather*, etc. He died in Yonkers, N. Y.

EATON, MARGARET L. (O'NEILL): 1796-1879, Nov. 8; b. Washington: daughter of a hotel keeper. Married first to Purser John B. Timberlake, U.S.N., and, after his death, to John H. E. 1828, who was appointed sec. war by Pres. Jackson 1829. This led to great social excitement in Washington, where severe criticism of her was current in social circles, and

## EATON.

caused the appointment of a new cabinet. In 1836, Mr. E. was appointed U. S. minister to Spain, and during his four years' residence at Madrid, Mrs. E. was esteemed one of the most brilliant ladies of the court. She lived in Washington 1840-56. In 1856 her husband died, and in 1857 she married an Italian gentleman with whom she lived but a short time.

EATON, THEOPHILUS: 1591—1658, Jan. 7; colonial gov. of New Haven, Conn.; b. Oxfordshire, England. He was educated for commercial business, but was sent to Denmark, as an agent of the King of England, and resided there some years. He came with the Rev. John Davenport (q.v.) to Mass. 1637, and was immediately made a magistrate. But seeking a place for a new colony E. with his friends, after exploring the Conn. coast, chose the place called Quinnipiac, and settled there 1638. They contracted with the Indians for purchase of land now covering 7 townships, for which they paid 13 English coats. In 1639, with 6 others (the 'seven pillars') appointed by the people, he undertook to form a gov't. for the colony of New Haven. He became the first gov. of this colony and held the office till his death. In 1643 he was one of the commissioners appointed to form the 'United Colonies of New England,' and three years later he made a proposition to the Dutch gov. (of N.Y.) Kieft, to arrange an arbitration for the purpose of settling the differences between them. In his new home E. turned from mercantile to agricultural pursuits. He, like his associates, was strict in his religious views and observances, but was exceedingly courteous and agreeable in manners. In person he was handsome and commanding.

EATON, WILLIAM: 1764, Feb. 23—1811, June 1; b. Woodstock, Conn.: soldier. He served in the revolutionary army 1780-83, graduated at Dartmouth College 1790, was clerk of the house of delegates 1791-97, and was then appointed U. S. consul to Tunis, where, after much skilful negotiation with the bey, he secured an immunity for American merchantmen from attacks by Tunisian cruisers. In 1803, he returned to the United States, was soon afterward appointed U. S. naval agent to the Barbary States, and went to Tripoli with the American squadron 1804. Early in the following year he determined to restore Hamet, a former pasha who had been driven from the throne by his brother, Jussef Caramalli, collected a force of 500 men, marched 600 m. across a desert to Derne, cap. of the richest province of the country, and, with the aid of two vessels of the American fleet, captured the city. Within a few days the bey sent an army to recapture Derne, but E. successfully resisted and prepared for a rapid and stealthy march upon Tripoli, when he received intelligence that the bey had signed a treaty of peace with the United States. On his return he was highly complimented for his services by the press, and received a grant of 10,000 acres of land from Mass., and a gold box from the king of Denmark in appreciation of his liberation of Danish captives at Tripoli. Subsequently Aaron Burr vainly endeavored to



## EATON—EAU CLAIRE.

engage him in his conspiracy, and when brought to trial E. was a strong witness against him. He d. in Brimfield, Mass.

EATON, WYATT: artist: 1849, May 6—1896, June 7; b. Phillipsburg, Can. He studied in New York at the National Acad. of Design and with Joseph O. Eaton, and in Paris with Gérôme, and after spending some years in study, sketching, and travelling in France and England, opened a studio in New York. He was one of the founders and the first sec. of the Soc. of American Artists, and has achieved success as a portrait and figure-landscape painter. Among his paintings are *Farmer's Boy* (1870), *Reverie* (1875), *Harvesters at Rest* (1876), *Boy Whittling*, *Portrait of William Cullen Bryant* (1879), and *Grandmother and Child* (1880).

EAU, n. *ō*, EAUX, F. plu., EAUS, Eng. plu. *ōz* [F. *eau*—from L. *aqua*, water]: an essence or perfumed spirit. EAU-D'ANGE, -*dǎngzh'* [F. water of the angel]: the angelic water; an agreeable perfume distilled from myrtle-flowers. EAU-DE-BOUQUET, *ō'dé-bô-kā'* [F. water from a nosegay], a compound perfume, distilled from a collection of various flowers. EAU-DE-LUCE, *ō'dé-lós'* [F. the water of *Luce*—the name of the inventor]: a strong-scented solution of ammonia rendered milky by mastic and oil of amber, used as a remedy in E. India for the bites of venomous reptiles and insects. EAU-DE-VIE [F. water of life]: see BRANDY.—See EAU-DE-COLOGNE: EAU CREOLE: EAU-DE-JAVELLE: EAU-DE-LUCE.

EAU CLAIRE, *ō-klär'*: city; cap. of E. C. co., Wis.; at the confluence of the E. C. and Chippewa rivers and at the head of navigation of the latter. The city is reached by three railroads, viz.: the Chicago Milwaukee and St. Paul, the Chicago St. Paul Minneapolis and Omaha, and the Wis. Central. It is 89 m. e. of St. Paul, Minn., and 183 m. n.w. of Madison, and is the principal commercial and manufacturing city in n.w. Wis., being especially noted for its large lumber interests, as it practically commands the business of the Chippewa valley, containing more than 5,000,000 acres, mostly in standing pine. In 1900, its mfg. establishments had \$4,756,338 invested in real estate and machinery and \$2,491,102 in stock and material; employed 1,858 persons; and paid \$726,565 in wages. The output was represented by lumber, shingles, and lath, \$1,592,472; other articles of wood, \$229,200; cigars and cigarettes, \$49,385; flour, \$85,000; iron products, \$188,233; wagons, carriages, and sleighs, \$10,200; articles of leather, \$1,550; cotton fabrics, \$3,500; beer, \$3,600; drain-tile, \$7,500; feed, \$8,000; total output, \$4,366,230. There were 20 saw and planing mills, with an annual output of about 300,000,000 cubic ft.; furniture and sash, door, and blind factories; iron and brass foundries; and several grain-elevators. The city has improved water-works; steam fire department; gas and electric lights; a bridge across each river; electric street railway; 18 churches; public-school property valued at over \$100,000; there is a national bank, with capital \$100,000, loans and discounts \$509,062, resources \$661,683, and deposits \$434,658; also 1

## EAU-CRÉOLE—EAVES.

bi-weekly, 5 weekly, and 3 daily papers. The assessed valuations for 1902 were: real estate, \$4,965,345; personal property \$2,652,222, total \$7,617,567; total tax rate \$32.48 per \$1,000; and 1903, Feb. 1, the bonded debt was \$200,000, floating \$4,000, sinking fund \$24,375, and net debt \$224,625. Pop. (1880) 10,119; (1890) 17,415; (1895) 18,637; (1900) 17,517.

**EAU-CRÉOLE**, *ô krā-ôl* [Fr. creole water]: a very fine liqueur, made in Martinique, by distilling the flowers of the Mammee Apple (*Mammea Americana*) with spirit of wine.

**EAU-DE-COLOGNE**, *ô-dè ko-lôn'* [Fr. water of Cologne]: celebrated perfume, invented long ago by the Farina family in Cologne, and since manufactured chiefly by members of the same family. It is made also in France and other countries. It consists principally of spirits of wine, with numerous essential oils harmoniously mingled together, producing a refreshing and delicate scent. The recipe said to be followed in the manufactories at Cologne is 12 drops of each of the essential oils neroli, citron, bergamot, orange, and rosemary, with one drachm of Malabar cardamoms, and one gallon rectified spirit. The whole is distilled together, and the condensed liquid constitutes Eau de Cologne.

**EAU-DE-JAVELLE**, *ô-dè-zhâ-vèl'* [Fr. water of Javelle]: solution of hypochlorite of potash, which, when administered to man, is stated to act as a powerful poison on the nervous system, producing general rigidity, and even tetanic spasms. It is useful in removing stains from linen fabrics.

**EAU DE LUCE** [Fr. water of Luce—the inventor]: strong-scented solution of ammonia rendered milky by mastic and oil of amber; formerly a popular stimulant, and still used in the E. Indies as a remedy for bites of venomous reptiles and snakes.

**EAUX BONNES**, *ô bon*: fashionable watering-place of France, dept. of Basses-Pyrenees, 20 m. s.s.e. of Oloron. It stands in a narrow gorge surrounded with rocks, and consists of a street of about 30 large and well-built hotels and lodging-houses. On the opposite side of the street there is an open space laid out as a shrubbery, and planted with trees; it is called the Jardin Anglais. E. B. is much frequented for its hot sulphureous springs, four in number, used for bathing. Their temperature does not exceed 91° F. There is also a cold spring here, used for drinking. The springs are said to be very valuable for their power of checking incipient consumption, and of curing various affections of the lungs and chest. In the season of the E. B. from June to October, it is crowded with visitors and patients. Pop. (1891) 874.

**EAUX CHAUDES**, *ô shôd*, **LES**: watering-place in France, 3 m. s.e. of Eaux Bonnes. Its springs have the same properties as those of the Eaux Bonnes (q.v.).

**EAVES**, n. *ēvz* [AS. *efese*, margin, edge; *efesian*, to shave: old Dut. *ovese*; Fris. *ose*, eaves. The final *s* is often



mistaken for the sign of the plural: hence we sometimes find a fictitious singular form, EAVE]: in *architecture*, the edge of a sloping roof which overhangs the wall, for the purpose of throwing off the water. When there is no concealed gutter at the margin to conduct the water to spouts or pipes, but the water is allowed to drop from the roof to the ground, they are called *Dripping Eaves*. EAVESDRIP, or EAVESDROP [A.S. *yfesdrype*]: water which drops from a projecting roof, as distinguished from the water collected in a spout, to which the Romans gave the name *flumen*. 'The owner of a private estate,' says Kemble (*Saxons in England*, I, 45), 'was not allowed to build or cultivate to the extremity of his own possession, but must leave a space for eaves. The name for this custom was *yfesdrypc*.' The space was regulated by the charter 'by which the property was held: in a charter of 868, it is limited to two ft. This Saxon custom corresponded to the well-known urban servitude of the Romans called *stillicide* (*stillicidium*). Similar regulations existed in Greece, and probably in all civilized countries. EAVESDROP, v. *ēvz' drōp* [Dut. *oosdruip*, eavesdropping—*lit.*, to acquire information by drops or dribblets]: to stand under the eaves of a window, or at a door, to listen to what is being said within doors. EAVES'DROPPING, n. listening at doors or windows to what is said within. EAVES'DROPPER, n. an insidious listener; one who 'listens under walls or windows, or the eaves of houses, to hearken after discourse, and thereupon to frame slanderous or mischievous tales.'—Blackstone's *Comm.* iv. 168. Such persons are by law regarded as common nuisances: they may be indicted, and on conviction, are punishable by fine. Persons who by their conduct expose themselves to suspicion of an intention to commit this offense, may be brought before a magistrate, and required to give security for their good behavior.

EBAL: see GERIZIM AND EBAL.

EBB, n. *ēb* [Ger. and Dut. *ebbe*, the falling back of the tide: Ger. *aben*, to fall off, to sink—connected with *evening*]: the reflux or flowing back of the tide; decline; a falling from a better to a worse state: V. to flow back, as the tide; to return, as the waters of the sea; to decay or decline. EB'ING, imp.: N. the flowing back of the tide. EBBED, pp. *-ēbd*. EBB-TIDE, the retiring tide. EBB AND FLOW: see TIDES.

EBELIANS, n. *ē-bēl' i-anz* [named after *Ebel*, a Prussian archdeacon, one of the founders]: in *chh. hist.*, revivalist sect which arose in Königsberg, in Prussia, about 1836, the Archdeacon Ebel and Dr. Diestel being its leaders. They believed in spiritual marriage. In 1839 sentence was passed against their leaders, who were charged with unsound doctrine and impure lives, but it was removed in 1842.

EBENACEÆ, *ēb-ēn-ā'sē-ē*: nat. ord. of exogenous plants, consisting of trees and shrubs, with alternate leathery leaves, and axillary flowers, which are monopetalous, somewhat leathery, and generally unisexual; the fruit fleshy. They have not a milky juice. They are regarded as allied to

*Aquifoliaceæ* (holly, etc.), *Apocynaceæ*, and *Oleaceæ*. About 160 species are known, mostly tropical, but a few are natives of Europe, and other temperate countries. The wood is in general remarkable for hardness, as the different kinds of ebony (q v.) and other species of *Diospyros*; and on account of this quality, even that of species which never attain the ordinary size of timber trees is sometimes accounted valuable, as of *Royena lucida*, the African bladder-nut or zwart-bast, at the Cape of Good Hope; where also that of *Euclea undulata*, a hard brown wood, is esteemed for cabinet-work. The fruit of many species is eatable: see DATE PLUM. The fruit of *Embryopteris gelatinifera* contains a viscid juice, and is used in all parts of India for paying boats.

EBERHARD, *ä'ber-hart*, or *ëb'er-hart*, AUGUST GOTTLÖB: 1769–1845, May 13; b. Belzig: German author. He studied at Leipsic and Halle, and attracted attention by his contributions to a periodical devoted to *belles-lettres*, entitled *Ida's Blumenkörbchen* (Ida's Flower-basket). Among his numerous works were *List um List, oder was ein Kuss nicht vermag* (Trick for Trick, or what could not a Kiss do); *Ysop Lafleur's Sämmtliche Werke* (Ysop Lafleur's Collected Works); *Ferdinand Werner, der Arme Flötenspieler* (Ferdinand Werner, the poor Fluteplayer); and *Ischarioth Krull's Lehren und Thaten* (Ischriot Krall's Doctrines and Doings); *Hannchen und die Küchlein* (Jenny and the Chickens), a narrative poem in ten parts, which has gone through many editions, and been often translated into other languages, and *Der erste Mensch und die Erde* (The First Man and the Earth), a poem marked by simple dignity and lively representation. E. died at Dresden.

E'BERHARD, JOHANN AUGUST: 1739, Aug. 31—1809, Jan. 6; b. Halberstadt: philosophical writer of Germany. He studied theology at Halle, 1756–59; and after spending several years as a preacher in Berlin and Charlottenburg, became prof. of philosophy at Halle 1778, and Doctor of theology 1808. E.'s first work was his *Neue Apologie des Sokrates* (New Apology of Sokrates), 2 vols. Berlin 1772, vindicating common sense against theological narrowness. Among his writings were *Sittenlehre der Vernunft* (Ethics of the Reason), Berlin 1781; *Theorie der schönen Künste und Wissenschaften* (Theory of the Fine Arts and Sciences), Halle 1783; *Allgemeine Geschichte der Philosophie* (Universal History of Philosophy), Halle 1788; *Handbuch der Aesthetik* (Manual of Æsthetics), 4 vols. Halle 1803–05; and *Versuch einer allgemeinen Deutschen Synonymik* (An Attempt toward a Complete Work on German Synonyms), 6 vols. Halle 1795–1802, enriched and improved by Maas, 1818–21, and again by Gruber, 1826–30, but which was, at its appearance, the best work of the kind in the German language. Toward the close of his life, E. struggled, but without success, against the speculative excesses of the new schools of philosophy headed by Kant and Fichte. E. was a clear and sensible thinker, as well as an agreeable and interesting writer.



## EBERNBURG—EBIONITE.

**EBERNBURG**, *ā'bĕrn-bŭrch*: small town in the Bavarian Palatinate, about 20 m. s.w. of Mayence, at the junction of the Alsenz with the Nahe. It is notable for the ruins of its castle, which formerly belonged to the famous knight Franz of Sickingen, a devoted friend of the early reformers. His stronghold, formerly considered almost impregnable, afforded a secure retreat from danger and persecution to Melanchthon, Bucer, Œcolampadius, and Ulrich von Hutten, the last of whom composed several of his works here. After the death of Sickingen, the castle of Ebernburg was besieged and dismantled by the Electors of Hesse and of Treves. Pop. about 500.

**EBERS**, *ā'bĕrs*, **GEORG MORITZ**: b. Berlin, 1837, Mar. 1: Egyptologist and novelist. He studied law at Göttingen, took up the subject of Egyptology at Berlin, and recovering from a long illness, established himself as a lecturer at Jena, where 1868 he was made professor. Next year he made a long journey in Egypt and the East, and in 1870 was called to Leipsic. In 1872, again in Egypt, he discovered the famous *Papyrus Ebers*, an ancient Egyptian medical treatise. He was paralyzed in 1876, and enforced inaction induced him to resume historical novel-writing. His works include *Uarda* (1877); *Homo Sum*, which he considered his best work (1878); *The Sisters* and *An Egyptian Princess* (1880); *The Emperor* (1881); *Only a Word* (1883); *Serapis* (1885); *The Bride of the Nile* (1886); *Margery* (1889); *The Elixir and Other Tales* (1890); *The Thorny Path* (1891); *The Story of My Life* (1893); *Cleopatra* (1894). His *Egypt, Descriptive, Historical, and Picturesque* (2 vols.) appeared 1880. He died 1898, Aug. 8.

**EBERT**, *ā'bĕrt*, **KARL EGON**: Bohemian poet; b. Prague, 1801: for many years a librarian at Donaueschingen. He has written lyrical, epical, and dramatic poems, the most noteworthy separate works being *Wlasta* (1829), *Das Kloster*, *Fromme Gedanken*, and *Am Bergsee* (1879). His poems are marked by lyrical vehemence and elegance of language. In his compositions the German and Czech characteristics are happily united. His collected works fill 7 vols. (1877). *Das Gelübde* was acted with much success. D. 1882.

**EBIONITE**, n. *ē'bī-ō-nīt* [Heb. *ebionim*, the poor]: one of a heretical body of Jewish Christians in the very first age of the Church. The name was probably given originally by the hierarchical or influential party among the Jews, to those of their countrymen who professed the Christian faith, and who generally belonged to the *poorer* and more ignorant class (John, vii. 48, 49). Subsequently, it seems that the Gentile Christians, ignorant of Hebrew, employed it in a distinctive sense to designate their Jewish co-religionists, who, in addition to their belief of Christianity, observed the Mosaic law. Irenæus is the first writer who makes use of the name. It is highly probable that the Ebionites became an organized body or sect, first at Pella, a city in Peræa, on the e. side of the Jordan, whither they had betaken themselves on the breaking out of the Roman-Jewish war in the time of Hadrian. Here, indeed, a strictly

Jewish-Christian church continued to exist till the 5th c. Among the Ebionites, however, there was no unanimity of religious feeling, or uniformity of opinion. Two great divergent parties are clearly recognizable—the Ebionites, proper, and the Ebionitic Nazarenes. The former were little different from Jews: their conceptions of the Savior were meagre and unspiritual. They believed that Jesus was simply a man distinguished above all others for *legal* piety—pre-eminently a *Jew*, and selected as the Messiah because of his superior Judaism. Of course they denied his supernatural birth, yet not his resurrection; for ‘they lived in expectation of his speedy return to restore this city of God (Jerusalem), and to re-establish the theocracy there in surpassing splendor.’—*Neander*. They were the genuine descendants of those Judaizers who plagued the church in the time of the Apostle Paul, and with whom he reasons in his epistle to the ‘foolish Galatians.’ The Ebionitic Nazarenes, on the other hand (who at the close of the 4th c. seem to have dwelt chiefly about Berœa, in Lower Syria, but at an earlier period may have been more widely diffused), were Jewish Christians, in the better sense. They conceived it to be their *own* duty still to circumcise, keep the Sabbath, etc., but they had no wish to impose the peculiarities of Judaism on the Gentile Christians. They did not believe that Christianity was merely a glorification of Judaism, but a new life come into the world, in which the Gentile might at once participate, without undergoing a Mosaic ordeal. Like the stricter Ebionites, they used a *Gospel of Matthew*; but it contained what the other did not—an account of the supernatural conception and birth of the Savior. According to *Neander*, who has thoroughly investigated this question, there were a great many varieties of opinion among the E., springing out of the differences above spoken of, which it would be profitless to trace. It is sufficient to say that *Essenism* (q.v.) modified Ebionism greatly, through the introduction of a Jewish mysticism, which recognized in Moses and Christ an inward identity of doctrine, and regarded them as revealers of the ‘primal religion,’ whose teaching, however, had been sadly corrupted. It is extremely probable that an Essenic Ebionite wrote the *Clementine Homilies*. See CLEMENS.

EBLANINE, n. *ěb'la-nîn* [etym. doubtful]: in *chem.*, a volatile crystalline spirit, obtained from crude pyroxylic spirit.

EBOE, n. *ě'bō* [W Indian word]: the name given in the W. Indies by planters and others, to the slaves brought from the Bight of Benin, who were a sickly, despondent race: ADJ. pertaining to the Eboes or their country. EBOE-TREE, n. in *bot.*, *Dipterix eboensis*,<sup>2</sup> large tree with heavy timber, growing in the Mosquito country in Central America. The natives use the oil for anointing their hair.

EBOLI, *ā'bō-lē* (ancient *Eburi*): small town of s. Italy, in the Principato Citeriore, about 16 m. e.s.e. from Salerno; picturesquely situated at a considerable elevation above sea-level. The climate, which does not become too cold in



## EBONITE—EBONY.

winter, notwithstanding the position of the town, is very unhealthful in summer, owing to the number of streams in the neighborhood. There is an annual fair at E., which lasts 12 days. Pop. 8,405.

**EBONITE**, n. *ěb'on-īt* [Eng. *ebony*]: name given by Mr. Goodyear to what is generally known as hard rubber. It is a vulcanite with a large proportion of sulphur and several other ingredients. Notwithstanding its name it sometimes resembles bone, wood, horn, ivory, etc. It is called also vulcanite.

**EBONY**, n. *ěb'ōn-ī* [F. *ébène*—from L. *ebēnus*; Gr. *ebēnos*, the ebon-tree: It *ebeno*]: a wood remarkable for its hardness, heaviness, and deep black color, the black duramen or heart-wood of different species of *Diospyros*, of the nat. ord. *Ebenaceæ*. the same genus which produces the date plum (q.v.), kaki, and other fruits. The best E., excelling in uniformity and intensity of color, is the produce of *D. Ebenum*, which grows in great abundance in some flat parts of Ceylon, and is a tree of such magnitude, that logs of its heart-wood, two ft. in diameter, and 10 to 15 ft. in length, are easily procured. *D. melanoxylon*, the



Ebony (*Diospyros Ebenum*).

E. tree of Coromandel, yields E. of good quality; *D. tomentosa*, *D. Roylei*, and other Indian species, also yield it. In Mauritius and Madagascar, E. of very good quality is produced by *D. reticulata*. Other species of *Diospyros* are much valued for their beautiful timber, very different in color from E., as calamander-wood (q.v.) and cadooberia (*Diospyros Ebenaster*). The last-named species is found in India and Ceylon. The prevailing black of the wood is beautifully striped with a rich yellowish-brown; but in density and durability it is far inferior to ebony.—E. is used by cabinet-makers chiefly for veneering. The ancient Greeks and Romans were acquainted with it; and it is sup-

## EBOULEMENT—EBRO.

posed that they obtained it either from India or Madagascar. They frequently inlaid it with ivory, for contrast of color. It is mentioned by Ezekiel (xxvii. 15) as an article of Tyrian commerce. It was at one time used in medicine, as a laxative and sudorific; it has a somewhat pungent taste.—The name E. is sometimes given to the black wood of trees very different from those of the genus *Diospyros*. An Abyssinian tree called Mozzungha (*Fornasinia*), of the order *Leguminosæ*, produces a black heavy wood, much resembling ebony.—WEST INDIAN E. or AMERICAN E. is produced by *Brya ebenus*, also of the nat. ord. *Leguminosæ*, but the wood is of a greenish-brown rather than a black color. It receives a good polish, is very hard and durable, and much sought after by musical instrument-makers. It is one of the articles of export from the W. Indies. But the tree is of small size, seldom more than 12 ft. high, and the trunk only a few inches in diameter. EBONY, a. like ebony; black. EB'ONIZE, v. -īz, to make black. EB'ONIZ'ING, imp. EB'ONIZED, pp. -īzd: ADJ. made to resemble ebony. EBON, a. *ěb'ôn*, of or like ebony; black. EBONITE, n. *ěb'ôn-īt*, a name for vulcanite, or vulcanized India-rubber, from its dark color—made of caoutchouc and sulphur.

EBOULEMENT, n. *ě-ból'-měnt* [F. *ébouler*, to fall down]: the falling down or crumbling away of the walls of a fortress; in *geol.*, a sudden fall or slip of rock in a mountainous district.

EBRACTEATE, a. *ě-brāk'tě-āt*, or EBRAC'TEATED, a. *-tě-ā-těd* [L. *e*, from; *bractĕā*, a thin layer of wood]: in *bot.*, without a bract or floral leaf.

EBRACTEOLATE, a. *ě-brāk'tě-ō-lāt* [L. *e*, without; *bracteola*, a thin leaf of gold]: in *bot.*, destitute of bractoles; not having small or secondary bracts

EBRIETY, n. *ě-brī'ĭ-tĭ* [F. *ébriété*, drunkenness—from L. *ebriĕtātem*—from *ebriŭs*, drunken]: intoxication; drunkenness: also INEBRIETY, in same sense, which see.

EBRILLADE, n. *ě-brīl'lād* [F.]: a check of the bridle which a horseman gives by a jerk of one rein, when the horse refuses to turn.

EBRO, *ěbrō* (Lat. *Iberus*): important river of Spain. It rises in the province of Santander, at a great elevation above the sea; about 12 m. n.w. of Reynosa, flows s.e. for about 25 m.; then e. past Frias, after which it maintains a general s.e. course, passing Miranda, Haro, Logroño, Tudela, and Zaragoza, when it turns n., passes Mequinenza, flows s.e. to Mora, s. to Tortosa, and finally e. to the Mediterranean; length abt. 540 m. Its mouth is choked with sand, and, to render it navigable, a canal called the San Carlos has been carried through the delta. Its principal affluents are the Najerilla, Jiloca, and Guadalope from the right, and the Aragon, Gallego, and Segre from the left. The course of the E. is chiefly through narrow, and sometimes rocky valleys; and its bed is characterized by many shoals and rapids which interrupt the navigation. This is partly remedied, however, by means of the Imperial Canal, from the vicinity of Tudela to 40 m. below Zaragoza



## EBULLITION—ECARTÉ.

**EBULLITION**, n. *ěb' ŭl-lish' ŭn* [OF. *ebullition*—from L. *ebullitiōnem*—from *ebullīō*, I boil or bubble up—from *e*, out; *bulla*, a bubble]: the boiling of liquids; the agitation or bubbling up of a liquid, caused by particles of it being changed into steam; effervescence; an outward display of feeling, as of anger. **EBULLIENT**, a. *ě-bŭl'yěnt*, boiling over. **EBUL'LIENCY**, n. *-yěn sĭ*, a boiling over. **EBUL'LIOSCOPE**, n. instrument for ascertaining the strength of distilled liquors by an observation of their boiling-point and the atmospheric pressure.—**SYN.** of 'ebullition': a boiling; ferment; fermentation; exhilaration.

**EBURNA**, n. *ě-běr'na* [L. *eburněŭs*, of ivory]: ivory shell, genus of mollusks, family *Buccinīdæ*. The shell when young is umbilicated; when adult the inner lip is callous, spreading, and covering the umbilicus; the operculum is pointed. Fourteen species are known from the hotter parts of the e. hemisphere.

**EBURNEAN**, a. *ě-běr'nĭ ān* [L. *eburněŭs*, pertaining to ivory—from *ebur*, ivory]: made of ivory. **EBURNATION**, n. *ě'běr-nā'shŭn*, in *med.*, the excessive deposition of osseous matter in certain diseased states of bones.

**EBURNINE**, a. *ě-běr'nĭn* [L. *ebur*, ivory; Eng. suff. *-ine*]: of or belonging to ivory.

**EC**, prefix, *ěk* [see **EX**]: *ex* becomes *ec* before *c*.

**ECALCARATE**, a. *ě-kāl'kěr-āt* [L. *e*, without; *calcar*, a spur]: in *bot.*, without a calcar or spur.

**ECARINATE**, a. *ě-kār'ĭ-nūt* [L. *e*, without; *carina*, a keel]: in *bot.*, without a carina or keel.

**ÉCARTÉ**, *ā-kār-tā*: game of cards, usually played by two persons, but sometimes by three, the third player taking the place of the loser of the first game. Before shuffling, all the 2, 3, 4, 5, and 6-spots are removed; the deal is decided by cutting at the beginning of each game; and the lowest card, the ace, deals. The game consists of 5 points, unless otherwise agreed on; and two packs are commonly used alternately to prevent the possibility of the place of particular cards being remembered. The cards are dealt 3 at a time to each player, and then 2, or *vice versa*; the 11th card is turned up on the pack and is the trump. When the king of any suit is a trump, the dealer scores a point. Both the non-dealer (first) and the dealer have the privilege of exchanging any or all of the cards in hand if dissatisfied with them; a second deal is made from the top of the talon in the same manner as the first. If the dealer refuse to exchange any cards, the non-dealer scores double for the points he may make, except in the case of turning up a king trump; and if the non-dealer plays without proposing, the dealer scores double for the points he may make. Discarding may proceed as long as there are cards in the talon, if both parties agree; but when either party is satisfied with his hand the other must stop changing. The non-dealer names the suit he intends to lead and begins the play; his opponent is obliged to take the trick if he has a winning card of the suit led, but need not trump it unless he wishes. The

## ECAUDATE—ECBATANA.

holder of the king of trumps must declare it before he plays, or, if he leads it, may declare it after the play, but if his opponent covers it before his declaration he loses his score on it. As in other games the 'trump and the highest card of the suit led win the tricks. The winner of the first trick leads for the second, and the playing goes on, very much like that in the game of euchre, till the 5 tricks are played. A player must win 3 tricks to score 1 point, and 5 tricks to score 2; and it is possible for a player to score a game in a single hand.

**ECAUDATE**, a. *ē-kaw'dāt* [L. *e*, without; *cauda*, a tail]: in *zool.*, without a tail; in *bot.*, spikeless; without a stem.

**ECBALIUM**, n. *ĕk-bāl'ĩ ŭm* [Gr. *ekballō*, I throw out, with reference to the fact that the seeds when ripe are expelled from the fruit with considerable force]: in *bot.*, genus of *Cucurbitaceæ*. *E. agreste*, sometimes called *Momordica Elaterium*, is the squirting cucumber.

**ECBASIS**, n. *ĕk'ba-sĩs* [Gr. *ek*, out; *baino*, I go]: in *rhet.*, figure of speech in which the speaker treats of things according to their events and consequences. **ECBATIC**, a. *ĕk-bāt'ik*, in *gram.*, relating to a result, issue, or consequence. It is opposed to *telic* which denotes purpose or intention.

**ECBATANA**, *ĕk bāt'a-nā* (Agbatana, Achmēta, Hagmatana): ancient capital of Media; 12 stadia (about 1½ m.) from Mount Orontes, the modern Elwend. Its foundation was attributed by popular belief to Solomon or Semiramis, while the book of Judith ascribes it to Arphaxad (Phraortes?), and Herodotus to Deioces (B.C. 728). It was upon a conical hill, crowned by a temple of the Sun, and was enclosed by seven concentric walls, the innermost of which was gilded, and the next plated with silver; while the rest, in their order outwards, were painted orange, blue, scarlet, black, and white, respectively. As they rose in gradation toward the centre, all the battlements with their gorgeous hues—probably representing, in Sabæan fashion, the seven planetary spheres or the seven climes—were visible at once. The city is reported to have been 250 stadia in circumference. Its principal buildings were the citadel—a stronghold of enormous dimensions, where also the archives were kept, in which Darius found the edict of Cyrus the Great concerning the rebuilding of the temple in Jerusalem—and the royal palace. Cedar and cypress only were used for the woodwork, and the ceilings, beams, and rafters were overlaid with gold and silver. The mild climate and the magnificence of its structure singled out E. as the favorite summer residence, first of the Median, then of the Persian, lastly of the Parthian monarchs. After the battle of Arbela (B.C. 331), Alexander followed Darius thither, and secured an immense booty. It was again pillaged by the Seleucidæ; but such were the riches of this place, that Antiochus the Great still found 4,000 talents' worth of silver to carry away. E. subsequently fell into the hands of the Parthians; and it has since so utterly sunk into decay, that notwithstanding the frequent mention of it both in the Bible and



## ECBLASTESIS.

in classical writings, its very site can no longer be fixed with certainty. Gibbon and Jones tried to identify it with Tabriz or Tauriz; Williams, with Ispahan; while recent explorers, such as Rennell, Mannert, Kinneir, Morier, and Ker Porter, generally agree that the present Hamadan, with the supposed tombs of Mordechai and Esther (see HAMADAN), occupies the site of ancient Ecbatana. Sir Henry Rawlinson assumes two Ecbatanas, one the present Hamadan, the other the present Takhti-Suleiman,  $36^{\circ} 25'$  n. lat.,  $47^{\circ} 10'$  w. long. Both the orthography of the scriptural Achmēta, and the cuneiform Hagmatana in the Behistun Inscriptions, which, by changing the *m* into *b*, became Agbatana in Greek, seem to point to Hamadan. Broken columns, a few cuneiform inscriptions, coins, medals, and a fragmentary stone lion, placed there, according to the Eastern legend, by the sorcerer Apollonius of Thyane, at the command of Nebuchadnezzar, in order to guard the town from excessive cold and snow—all dug out near Hamadan—are all that remains of that once most royal of cities.—There was another ECBATANA in Persis, which was given to the Magi; and a third in Syria, at the foot of Carmel, the present Kaïffa, where Cambyes, the son of Cyrus, suddenly died, B.C. 520.



Ecce Homo.

ECBLASTESIS, n. *èk-blās-tē'sīs* [Gr. *ekblastanō*, I shoot or sprout out]: in *bot.*, production of buds within flowers,

## ECBOLE—ECCE HOMO.

or on inflorescences, in consequence of monstrous development.

ECBOLE, n. *ěk'bŏ-lē* [Gr. *ek*, out; *ballo*, I throw]: in *rhet.*, digression, in which the speaker introduces another person speaking in his own words; in *mus.*, the sharpening of sounds to adapt them to a change of key-note.

ECCALEOBION, *ěk-ka-lē-ŏ-bī-on*: incubator; or contrivance by which eggs are hatched by artificial heat. It consists of a block-tin or sheet-iron oven, supplied with a number of shelves on which the eggs are placed so that they may be turned daily till hatched. The heat which is maintained at a uniform temperature is derived from steam or hot water that circulates in pipes at the bottom of the oven. See INCUBATION, THE PERIOD OF.

ECCEDENTE, a. *ěk-sā-děn'tā* [It.]: in *mus.*, exceeding; augmenting; a term applied to intervals.

ECCE HOMO, *ěk'sě hŏ'mō* [L. *eccē*, behold; *hŏmō*, the man]: painted representation of Christ crowned with thorns, as at the time Pilate said 'Behold the man.' On this exalted subject the highest efforts of art have been employed. The finest 'Ecce Homo' is that of Correggio, in the National Gallery, London; the whole conception of this remarkable picture is of the first order of genius. Other conceptions have been painted, such as the well-known one by the great artist Guido Reni, a copy of which is given in the annexed illustration.



# ECCENTRIC.

**ECCENTRIC**, a. *ĕk-sĕn'trik*, or **ECCEN'TRICAL**, a. *-trĭ-kŭl* [OF. *eccentrique*, out of the centre—from mid. L. *eccentricŭs*—from L. *ex*, out of; *centrum*, centre—*lit.*, out of the centre or usual manner]: odd; singular; departing from the usual course; not having the same centre: N. a circle not having the same centre as another. **ECCENTRIC**, in machinery (now frequently **EXCENTRIC**), wheel having its axis out of the centre: contrivance for taking an alternating rectilinear motion from a revolving shaft. It consists of a circular disk or pulley, fixed on a shaft or axis which does *not* pass through the centre of the disk. The right-hand

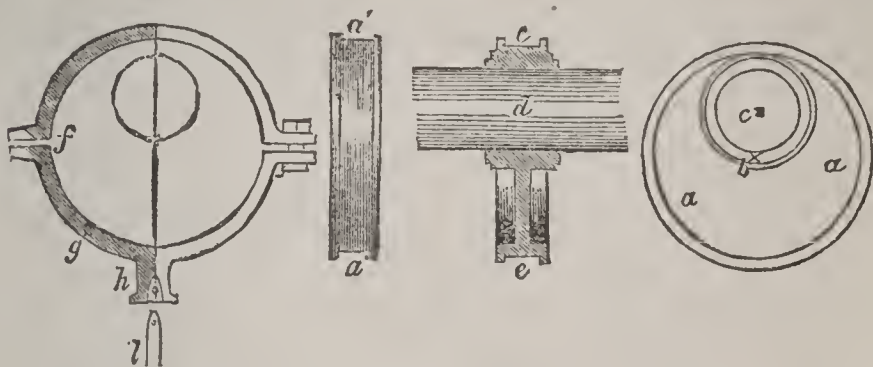
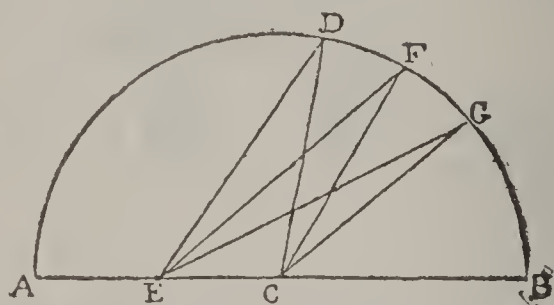


figure of the cut represents a side-plan of an eccentric; *aa* the disk, the centre of which is at *b*; the inner circle is the shaft, with its centre at *c*; *ee* is a section along the axis of the shaft *d*; and *a'a'* an edge-view. A hoop, *gf*, embraces the groove *a'a'*, allowing the disk to turn within it. As the eccentric revolves with the axis, the hoop is alternately raised and lowered, and with it the rod *l*, which is keyed into it at *h*. The extent of the rise and fall of the rod is equal to twice *cb*, the distance between the centres. The eccentric is used chiefly where a subsidiary motion of small power is required; as for working the force-pump that supplies the boiler of a steam-engine (q v.). **ECCENTRIC**, or **ECCENTRIC CIRCLE**, a supposed orbit in the Ptolemaic astronomy. It was a fundamental doctrine with the ancient astronomers, that every heavenly body moved in a circle (the perfect figure), and at a uniform rate. To move otherwise than uniformly and in the perfect figure, would have been unbecoming a heavenly body! But some of those bodies appeared to misbehave by moving unsteadily, and in other figures than circles. Of course this must be a mere deceptive appearance; but then, to save the fundamental doctrine, it must be explained. To explain it, they invented the *eccentric* circle. Suppose a body, such as the sun, to move in a circle *ADB* at a uniform rate, and a spectator to observe it, not from *C*, the centre of the circle, but from *E*. Then, if the sun's movement in a given time be from *D* to *F*, and in an equal interval thereafter be from *F* to *G*, a spectator at *C* would observe these movements as being circular and made in equal times, because at *C*, *DF* and *FG*, being equal, subtend equal angles. But if the spectator, instead of being at *C*, be at *E*, then, as the angles *DEF*, *FEG* are unequal, the sun's motion will not appear to be

## ECCENTRIC.

uniform, nor will his path appear quite circular. If, then, the earth, instead of being at the centre of the sun's orbit, be in position away from it, the want of regularity in his movements will be explained. He will appear to describe unequal spaces in equal times. Accordingly, to reconcile the observed fact with the fundamental doctrine, the ancients placed the earth at E, a point away from the centre of the sun's supposed orbit. Hence this orbit was called, the *Ec-centric*, in respect that its centre did not coincide with that of the earth, which was considered as the centre of the universe. ECCENTRICALLY, ad. -ly. ECCENTRICITY, n. *ĕk'sĕn-trĭs'ĭ-tĭ*, the being odd or singular: in *mechanics* and *astronomy*, deviation from a centre; the distance of the centre of a planet's orbit from the centre of the sun. See fig.



Eccentric Circle.

**ECCENTRIC CIRCLE.** In such a figure as the eccentric circle, the eccentricity is the ratio of EC to the radius. In the ellipse and hyperbola (q. v.), the eccentricity is the ratio of half the distance between the foci to the semi-major axis. In older mathematical works, eccentricity is sometimes used as the name of half the distance between the foci of an ellipse or hyperbola. **ECCENTRIC-CHUCK**, n. a chuck attached to the mandrel of a lathe, and having a sliding piece which carries the centre. By its means circular lines of varying size and eccentricity may be produced, but no oval or eclipse. **ECCENTRIC-CUTTER**, n. a cutting tool placed upon the slide-rest, and having a rotation by means of a wheel and shaft, the cutter being attached to the end of the latter. The rotation is obtained by an overhead motion, and the eccentricity by fixing the cutter at different distances from the centre by means of the groove and screw. The action of the eccentric-cutter differs from that of the eccentric chuck in this: in the latter the work is rotated and the tool is stationary; in the former the work is stationary and the tool revolves. When the two motions are used in conjunction the patterns are capable of almost unlimited variation. **ECCENTRIC-ENGRAVING**, n. an arrangement of diamond tracers, operated by elaborate machinery, acting upon a varnished roller designed for calico-printing. The effect is like that produced by the rose-engine lathe. **ECCENTRIC-FAN**, n. a fan-wheel with radial arms and vanes, and having an axis which is eccentric with the case in which it revolves. The case has a scroll form, and the effect is to make the discharge of air more perfect and avoid carrying



## ECCE SIGNUM—ECCLESIA.

a body of air around between the vanes. **ECCENTRIC-HOOK**, n. in *steam-eng.*, a hook used to connect the eccentric-rod with the wrist on the lever of the rock-shaft which actuates the valve; otherwise called a GAB. **ECCENTRIC-HOOP**, n. the strap on the eccentric of an engine. **ECCENTRIC-PUMP**, n. a hollow cylinder in which is a revolving hub and axis eccentrically arranged. On the hub are flaps which act as pistons in the space between the hub and the case to expel the water, which enters at one opening and flows out by another. The same construction is seen in rotary steam-engines with this difference, that in one case the shaft revolves to force water, and in the other the steam passes through to drive the shaft. **ECCENTRIC-STRAP**, n. in *mach.*, the ring inclosing an eccentric sheave and connecting by a rod to the object to be reciprocated, as the slide valve of a steam-engine. *Note.*—**ECCENTRIC** is applied to 'strangeness of manner or conduct,' though strictly meaning 'out of the centre,' or applied to a body whose centre of motion does not correspond with its centre of form; in the latter sense the spelling is now usually *excentric*; while the spelling *eccentric* is restricted to the metaphorical sense.—**SYN.** of 'eccentric, a.': strange; anomalous; irregular; particular; whimsical.

**ECCE SIGNUM**, *ĕk'sē sĭg'nŭm* [L.]: behold the sign, proof, or badge.

**ECCHYMOSIS**, n. *ĕk'ĭ-mō'sĭs* [Gr. *ek*, out of; *chumos*, juice, sap—from *chŭō*, I pour out]: discoloration of the skin, livid spots or blotches produced by blood effused below, or in the texture of, the skin. It is usually attended by swelling to a greater or less extent, and is the result of injury, as in a 'black eye.' The presence of E. is sometimes adduced in courts of law as a proof of violent injuries having been inflicted during life, or very shortly after death. E. may sometimes be diminished by applying cold cloths or a bladder of ice to the surface, in the case of injuries quite recently inflicted.

**ECCLE-GRASS**, n. *ĕk'klĕ-grās* [etym. doubtful]: in *bot.*, butterwort, *Pinguicula vulgaris*.

**ECCLESFIELD**, *ĕk'k'lz-fĭld* or *-fĕld*: township in the West Riding of Yorkshire, five miles north of Sheffield, England. The chief manufacture is cutlery, but flax, linen, and nails also are branches of industry. There are coal and iron mines in the vicinity. Pop. (1891) 25,890.

**ECCLESIA**, *ĕk-klĕ'zĭ-ā* [Gr. from *ĕkklētōs*, called out—from *ĕk*, out of, and *kālĕō*, I call]: name given by the Greeks to an assembly of persons called out for any purpose from their homes. I. At Athens, Sparta, and other cities, it was applied specially: 1. To the assembly of free citizens, called to consider and vote upon public affairs; 2. To a larger assembly, representing an alliance of several cities or states. II. This being the common usage of the term, well known wherever the Greek language was understood, it was naturally employed in the Septuagint translation of the Old Testament to designate the assembly

## ECCLESIASTES.

or congregation of the Israelites: 'Who is there among all the tribes of Israel who came not up with the congregation [ecclesia]?' Judges xxi. 5; 'before all the congregation [ecclesias] of Israel': Jôsh. viii., 35; 'in the midst of the congregation [ecclesias]: Ps. xxii. 22. III. From this the transition was easy to the New Testament use of the word to denote *an assembly or company of the disciples of Christ*. (It is rendered in our English translations by the word 'church'—kirk—which comes from another Greek word—*kuriaka*—signifying *belonging to the Lord*.) 1. It is applied to a small company consisting of a man's own family or friends: 'the church (company of disciples) in thy house;' 2. To a larger number, in a city or town, who hold their own religious meetings, and manage their affairs according to rules of order adopted by themselves: 'the church at Jerusalem'—'of Ephesus'—'in Smyrna.' 3. In the plural number it designates the various local Christian assemblies of a district, or province, or in general: 'the churches of Judea,' 'of Galatia,' 'of Macedonia,' 'of the Gentiles,' 'of God.' 4. It denotes the general body of believers, without restriction to place or time: 'Christ is the head of the Church': 'the church of the living God.' 5. It includes the whole company of the redeemed as the inheritors of heaven: 'the general assembly and church of the first born who are enrolled in heaven.' While this term 'ecclesia,' as setting forth a congregation or company, has been in a great degree withdrawn from the sight and thought of English readers by having been translated '*church*,' it still has a place in our language which keeps alive its relation to the church: e.g. 'ecclesiastical history,' meaning the history of the church; 'an ecclesiastic,' denoting a clerical officer; and 'the book of Ecclesiastes' is the book of the Preacher. It is noticeable, however, that *ecclesiastic* and *ecclesiasticism* have been quite turned from the New Testament reference to the church viewed as a congregation, and are used with reference to the church viewed as represented by its official members and ministers, or by a hierarchy.

ECCLESIASTES, n. *ĕk-klē'zī-ās'tēz* [mid. L. *ecclēsīās'ticus*, cleric, Christian—from Gr. *ekklēsīā*, an assembly, a church: L. *ecclēsū*]: one of the books of the Old Testament. ECCLE'SIAS'TICUS, n. *-ās'tī-kūs*, a book of the Apocrypha. ECCLE'SIAS'TIC, n. a clergyman; a priest. ECCLE'SIAS'TIC, a. *-tīk*, or ECCLE'SIAS'TICAL, a. *-tī-kāl*, pertaining to the church. ECCLE'SIAS'TICALLY, ad. *-lī*. ECCLE'SIAS'TICISM, n. *-as'tī-sīzm*, clerical principles. ECCLESIASTICAL-MODES, n. the church modes, or the keys anciently used.

ECCLESIAS'TES [Eng. the Preacher]: title (taken from the Septuagint) of a canonical book of the Old Testament; its Hebrew name is *Koheleth*, which signifies nearly the same. The inscription with which it commences is: 'The words of Koheleth, the son of David, king in Jerusalem.' Its authorship is commonly ascribed to Solomon. In support of this opinion, however, there is not a vestige of internal evidence except what arises from the dramatic use of



his name, an expedient in all probability resorted to by the writer to give force and emphasis to his own reflections, inasmuch as Solomon was held by the Jews to be the perfection of human wisdom. The first who doubted the Solomonian authorship of the book was Grotius. Later critics have advanced further than Grotius. The actual writer probably lived, according to Dr. Davidson, in the later period of the Persian government, not long after the time of Malachi, i.e., B.C. 350-340. Such is also substantially the opinion of Rosenmüller, Knobel, Ewald, and De Wette. Hengstenberg, unquestionably one of the ablest critics of the orthodox German school, considers that the contents of the book may best be explained by supposing the author to have lived in a period like that of Malachi, in which there prevailed a pharisaical self-righteousness, and melancholy murmurings against the providence of God. The dates assigned to it by Hartmann (viz., the period of the Maccabees) and by Hitzig (B.C. 204) cannot well be sustained, as there is no trace in the book of either Grecian philosophy or language.

The chief arguments against the Solomonian authorship are *three*. 1. The writer indicates unconsciously his own posteriority in point of time by making Solomon say: 'I was king over Israel in Jerusalem' (i. 12); this, however, Solomon might have said during his life. 2. The condition of the country in the time of the writer, the oppression, judicial injustice, the elevation of fools and slaves to high offices, etc., do not fit the reign of Solomon at all, nor any preceding period. 3. The language is post-exilian. Ewald, one of the greatest of recent Orientalists, asserts that 'the Hebrew is so strongly penetrated with Aramæan, that not only single often-recurring words are entirely Aramæan, but the foreign influence is infused into the finest veins of the language.'—(See Ewald, Knobel, Hitzig, Graetz, Delitzsch; also Stuart and Ginsburg.)

It is difficult to ascertain the stand-point of the author. He is deeply convinced that 'all is vanity and vexation of spirit,' but whether this conviction springs wholly from a religious view of life, or is in part caused by personal disappointments, we have not sufficient internal evidence to determine. There is much in E. that, if it stood by itself, might be thought to be a mere product of cynical epicureanism, but it is mixed with so much that is nobler, with a faith in God that rises high above the crushing considerations of the vanity of all mortal life, and the book terminates so grandly, that it seems more reasonable to believe that the aim or intention of the writer was moral and religious, and not cynical; that he painted the folly, weakness, and helplessness of men in such strong colors, only that he might destroy their self-righteousness, and cure them of that inability to read the laws of God, which self-righteousness always produces. For what is the conclusion of the whole matter? 'Fear God, and keep his commandments: for this is the whole duty of man.'

ECCLESIASTICAL COMMISSIONERS FOR ENGLAND: 'a corporation with perpetual succession and a'

## ECCLESIASTICAL COURTS.

common seal, and with power to take, purchase, and hold, real estate, notwithstanding the statutes of mortmain.'—Burns's *Eccles. Law by Phillimore*. The Ecclesiastical Commissioners consist of all the abps. and bps. of England and Wales, the deans of Canterbury, St. Paul's, and Westminster, certain judges and cabinet ministers, with 11 eminent laymen appointed by the crown and one by the abp. of Canterbury. This Ecclesiastical Commission, permanently established 1836, has power to inquire into the revenues of bishoprics, cathedrals, etc., and to prepare and lay before the queen in council any desirable readjustments; also it has power to divide and unite parishes, and to make new districts for ecclesiastical purposes. The application of the revenues from suppressed canonries, prebends, etc., is an important part of the work of the E. C. As a corporation they are the largest landholders in England—holding about 300,000 acres, much of it the best agricultural land in the country. Net income from all sources (1888) £1,120,000. As a result of its deliberations during 25 years, two new bishoprics had been created and endowed, and a considerable number of small livings had been augmented. On the other hand, indignation has been excited by its expenditure of very large sums on the purchase and improvement of episcopal residences. The pitiful incomes of a multitude of the clergy have added keenness to the criticism.

**ECCLESIAS'TICAL CORPORA'TION:** in the law of England, holder of an ecclesiastical benefice. Ecclesiastical corporations are divided into aggregate and sole. An E. C. aggregate consists of several persons, as the head and fellows of a college, the dean and chapter of a cathedral, and is kept up by a continual succession of members. An E. C. sole consists of a single person and his successors in the benefice, as a bishop, a rector, a parson, or a vicar.—See CORPORATION.

**ECCLESIAS'TICAL COURTS:** courts specially devoted to the consideration of matters relating to the clergy, to church discipline, and to religion. The sphere, organization, and procedure of such courts are evidently different from those contemplated by the apostle Paul (I Cor. vi. 1) —'Dare any of you having a matter against the other go to law before the unrighteous [in this case heathen] and not before the saints?' The primitive companies of Christian believers plainly were not ecclesiastical courts in the modern sense, inasmuch as the apostolic injunction referring to them assigned to them no settlement of ecclesiastical matters, but only of differences in usual temporal business. Also, the question may arise in some minds whether the term 'court' is properly applied to any assembly in the church of which mention is found in the New Testament. As Christianity advanced, and was acknowledged as the revelation of the Almighty, these simple referees claimed an independent position as courts, and were suffered to exist concurrently with courts of civil jurisdiction (Code lib. i. tit. 4, *de episc. aud.*); and gradu-



## ECCLESIASTICAL HISTORY—ECCLESIASTICUS.

ally special matters were assigned to their peculiar jurisdiction—e.g., questions of tithes, and matrimonial and testamentary causes, etc.

In Bacon's Abridgment of the Law of England, there are enumerated ten ecclesiastical courts—viz., convocation, the court of arches, the prerogative court, the court of audience, the court of faculties, the court of peculiars, the consistory court, the archdeacon's court, the court of delegates, and the court of commissioners of review. (See these several titles; also DOCTORS' COMMONS.) In 1874 a new ecclesiastical judgeship was set up, with cognizance mainly of offenses in ritual.

The chief ecclesiastical courts (Presb.) which have at various times existed in Scotland are the general assembly, the commissary court, and the court of teinds. (See ASSEMBLY, GENERAL: COMMISSARY: TEINDS.)

In dissenting denominations in Great Britain, and in all denominations in the United States, the jurisdiction of E. C. depends entirely on contract or voluntary submission. In churches organized congregationally (Bapt., etc.) the term E. C. is not in use.

ECCLESIAS'TICAL HISTORY: see CHURCH HISTORY.

ECCLESIAS'TICAL LAW: see CANON LAW.

ECCLESIAS'TICAL TITLES ASSUMPTION ACT: a law in Great Britain passed 1851, relative to a claim of ecclesiastical titles in Britain by any dignitary of the Roman Church. In 1850 a ferment of Protestant zeal was awakened by an edict issued by the court of Rome dividing Great Britain into territorial bishoprics, under an archbishop of Westminster. By the Roman Catholic party it was alleged that previous enactments struck only at the titles to existing provinces and dioceses, and that there was no prohibition against the creation of an archbishopric of Westminster. To meet this allegation, Lord John Russell introduced the Ecclesiastical Titles Bill, which was passed, prohibiting the assumption of such titles 'in respect of any places within the United Kingdom,' by any person other than the person entitled to the same. The penalty was fixed at £100 for every contravention of the act. The act allayed the fears of the country; and no prosecution under it took place. In 1871 the act was repealed as inexpedient, but with a declaration that no ecclesiastical title of honor or dignity derived from any place within the realm can be validly created except by the queen's authority. Thus, though no prosecution can now take place for assuming such titles, their assumption in Britain is still treated by the law as illegal. No opposition was made to the constitution of a Rom. Cath. hierarchy in Scotland (1878), with territorial titles.

ECCLESIAS'TICAL YEAR: see YEAR: DATE.

ECCLESIASTICUS, *ĕk-klē-zī-ăs'tī-kŭs*: apocryphal work, called in the Septuagint *The Wisdom of Jesus, the Son of Sirach*. It obtained the title of E., not because the writer was a priest (for regarding his profession nothing is known), but because it was, in the opinion of the fathers,

## ECCLESIOLOGY.

the chief of those apocryphal works which they designated *ecclesiastici libri* (i. e., books not inspired, but which might be read in church for the edification of the people), to distinguish them from the canonical scriptures of the Old Testament. E. was originally composed in Aramaic; and the original text was apparently extant in the time of Jerome, who states that he had seen the Hebrew, but it is now lost. The author calls himself Jesus, the son of Sirach of Jerusalem; but his date is not known. His book was translated into Greek, with an introduction by his grandson, who is usually, but not correctly, supposed to have had the same name as his grandfather. The date of the translation has been fixed as late as B.C. 130, and as early as B.C. 230. The later date is the more probable. The contents of the work are not systematically arranged, so that we can only guess at what may be called the method and purpose of the thinking. The view taken of the mercy of God as extending to all mankind, indicates that the Jewish notions were breaking up; but still there is little to show that any great spirituality was taking its place. Its tone resembles that of the book of Proverbs. Exhortations to cheerfulness are constant; medicine, agriculture, etc., are highly praised; life is regarded from an ethical rather than from a religious point of view, and consequently 'wisdom' is represented as the source of human happiness. The style of the writer is at times noble, and even sublime; and, to use the language of Addison, 'it would be regarded by our modern wits as one of the most shining tracts of morality that are extant, if it appeared under the name of Confucius or of any celebrated Grecian philosopher.'

**ECCLESIOLOGY**, n. *èk-klē'zŭ-òl'ò-jŭ* [Gr. *ekklēsia*, a church; *logos*, a discourse]: the science of building and decorating churches; the science which investigates the development of the Christian Church in its rites of worship and government, as may be ascertained from order, architecture, arrangements, customs, and rites. **ECCLE'SIOLOG'ICAL**, a. *-lŭj'ŭ-kŭl*, pertaining to church-building, etc. **ECCLE'SIOL'O-GIST**, n. *-jŭst*, one who.—*Ecclesiology* is a word of recent use. Beside discriminating the various styles of ecclesiastical architecture, ecclesiology takes account of the ground-plan and dimensions of a church; of its orientation, or the deviation of its line from the true east; of its apse, or circular or polygonal east end; of its altar or communion table, whether fixed or movable, stone or wood; of its reredos, dossel, or altar-screen; of its piscina, or basin and drain for pouring away the water in which the chalice was rinsed, or the priest washed his hands; of the sedilia, or seats for the priest, deacon, and subdeacon, during the celebration of the eucharist; of the aumbrye, or locker, for the preservation of the communion vessels and elements; of the 'Easter sepulchre,' or recess for the reception of the host from Good Friday till Easter Day; of the altar-candlesticks; of the altar-steps; of the altar-rails; of the credence table, or shelf on which to place the communion elements before they were put upon the altar; of the 'misereres,' or elbowed stalls; of seats within and without the chancel walls; of the



## ECCOPE—ECCYESIS.

height of the chancel as compared with the nave; of the chancel arch; of the rood-screen, rood-staircase, rood-door, and rood-loft; of the piers or columns; of the triforium or blindstory; of the clerestory; of the windows; of the parvise-turret, or outside turret leading to the parvise; of the roof or groining; of the eagle-desks and letterns; of the pulpit; of the hour-glass stand, by which the preacher was warned not to weary the patience of the flock; of the reading pew; of the benches, pews, and galleries; of the aisles; of the shrine, fertour, or reliquary; of the benatura, or holy-water stoup; of the corbels, with special reference to the head-dress figured on them; of the pavement; of the belfry; of the baptismal font, with its accessories; the baptistery, the steps, the kneeling-stone, the chrismatory, the cover, and the desk; of the tower, with its lantern, parapet, pinnacles, louvres, windows, buttresses, and bells; of the porch and doors, with their niches and seats; of the parvise, or priest's chamber above the porch; of the moldings; of the pinnacle crosses; of the gurgoyles, or rain-spouts; of the churchyard or village cross; of the churchyard yew; of the lych-gate, or corpse-gate, where the corpse was met by the priest; of the crypt; of the confessional; of the hagio-scope, or opening in the chancel arch through which the elevation of the host might be seen; of the lychnoscope, or low window in the side-wall of the chancel, the use of which is uncertain; of the chest for alms; of the table of the ten commandments; of the church-plate; of the fald-stool, or litany stool; of the embroidered work; of the images of saints; of the church well; of the sepulchral monuments and brasses, with their inscriptions; of the chapels or sacristies; of the vestry; of the dedication crosses. Ecclesiology has a literature of its own, represented by such works as the *Handbook of English Ecclesiology* (Lond. 1847) of the 'Ecclesiological Society'; Walcott's *Sacred Archeology*; Bourassé's *Dictionnaire d'Archéologie Sacrée*, and the like.—Recently, the study of the constitution of the church also has been termed ecclesiology.

**ECCOPE**, n. *ĕk'kō-pē* [Gr. *ek*, out; *koptō*, I cut]: in *surg.*, the act of cutting out; *specif.*, a perpendicular division of the cranium by a cutting instrument.

**ECCOPROTIC**, a. *ĕk'kōp-rōt'ĭk* [Gr. *ek*, out of; *kopros*, dung]: in *med.*, promoting the discharge from the bowels.

**ECCREMOCARPUS**, n. *ĕk-krēm-o-kâr'pŭs* [Gr. *ekkremēs*, hanging from or upon; *karpos*, fruit]: in *bot.*, genus of *Bignoniaceæ*. *E. scaber*, native of Chili, often cultivated in other countries as an ornamental creeper. It has fine orange-colored flowers.

**ECCRISIS**, n. *ĕk'krĭ-sĭs* [Gr. *ek*, out; *krinō*, I select]: in *med.*, excretion of excrementitious or morbid matter. **EC-CRINOLOGY**, n. *ĕk-krĭn-ōl'o-jĭ*, in *physiol.*, treatise on the secretions of the body.

**ECCYESIS**, n. *ĕk-sĭ-ĕ'sĭs* [Gr. *ekkueō*, to be pregnant]: in *obstet.*, extra-uterine fetation; imperfect fetation in some organ exterior to the uterus, as in the abdomen, in one of the ovaria, or in the Fallopian tube.

**ECDERON**, n. *ĕk'dĕr-ŏn* [Gr. *ek*, out; *deros*, skin, hide]: in *zool.*, the outer of the two layers of that part of the skin called 'ectoderm,' corresponding to the 'epidermis' in man, into which it shows a tendency to break up.

**ECDYSIS**, n. *ĕk'dī-sīs* [Gr. *ekdūsis*, a coming out, an emerging—from *ek*, out of; *dūō*, I enter]: the act of putting off or moulting; an emerging.

**ECHELON**, n. *ĕsh'ĕ-lŏng* [F. *échelon*, a ladder-step—from *échelle*; OF. *eschele*, a ladder—from L. *scāla*, a ladder]: the position of an army or body of troops in the form of steps of a ladder; an army arranged in lines or divisions, having the right of the one bordering upon, but slightly behind the left of, the other; the several divisions of the force, though parallel, are no two on the same alignment. Each has its front clear of that in advance, so that, by marching directly forward, it can form line with it. There are two kinds of echelon, *direct* and *oblique*. *Direct* echelon is adapted for attack and retreat; while *oblique* echelon (oblique in reference to the original front of the line) is adapted for changing position, or for getting on the enemy's flank.

The word echelon is used also in reference to nautical maneuvers. A fleet is sometimes said to be arranged *en échelon*; at which time it is compared by Sir Howard Douglas to a body of infantry in a square having its diagonal parallel with the front. In other words, it presents a wedge-form toward the enemy. Under this arrangement, the bow-guns and broadsides of the several ships can mutually defend each other. **ECH'ELONED**, a. *-lŏngd*, arranged in lines like steps, or as a series of terraces or platforms one above the other.

**ECHELON-LENS**, n.: in *optical instruments*, a large lens, constructed in several pieces, to be put together when used. They are used in light-houses, for which it is difficult to construct lenses each of a single piece.

**ECHEVERIA**, n. *ĕk-ĕ-vĕr'ī-a* [named after M. *Echeveri*, who made the drawings in the *Flora Mexicana*]: in *bot.*, genus of *Crassulaceæ*, tribe *Crassuleæ*. It has a five-parted calyx, petals united, stamens ten, and five carpels. The species are succulent plants with showy flowers, from Mexico. Many are cultivated in other countries in greenhouses.

**ECHIALES**, n. *ĕk-ī-ā'lĕz* [mod. L. *echium*]: in *bot.*, alliance of perigynous exogens. It has dichlamydeous, mon-apetalous, symmetrical or unsymmetrical flowers, nucamentaceous fruit, consisting of one-seeded nuts, or of clusters of them separate or separable, and a large embryo with little or no albumen. It contains the orders *Jasminaceæ*, *Salvadoraceæ*, *Ehretiaceæ*, *Nolanaceæ*, *Boraginaceæ*, *Brunoniaceæ*, *Lamiaceæ*, *Verbenaceæ*, *Myoporaceæ*, and *Selaginaceæ*. **ECHIAL**, a. *ĕk'ī-al*, pertaining, relating, or akin to the alliance *Echiales*, or to the genus *Echium*. **ECH'IALS**, n. the echial alliance.

**ECHIDNA**, n. plu. *ĕ-kīd'nă* [Gr. *echidna*, a viper]: genus of quadrupeds peculiar to Australasia, and belonging to the order *Monotremata*. Four species of these egg-laying mam-



## ECHIMYD—ECHINATE.

imals have been described, of which two are found in New Guinea. One egg is laid at a birth, and is then put in the mammary pouch to be hatched. It was formerly said that the specific distinctions (such as the greater abundance of hair) were not real, but depended merely on age. The E. is about the size of a hedgehog, and, like that animal, is covered with spines; which, however, are much larger and stronger, and are placed among soft silky chestnut-colored hair. Its head is small, the muzzle much elongated and slender, terminating in a small mouth, which is destitute of teeth but furnished with several rows of small spines upon the palate, directed backwards. The tongue is extensile,



*Echidna Hystrix.*

and is used, like that of ant-eaters, for catching ants, the ordinary food of the animal. The tail is very short. The legs are also very short, each foot furnished with five large broad claws, fit for digging and burrowing, the claws of the hind feet being concave, and directed backward and outward, forming very efficient shovels for throwing out the earth. The E. burrows with great rapidity, being possessed of strength perhaps greater in proportion to its size than that of any other quadruped. When it cannot more completely disappear under the earth, it inters itself so far as to present only its spiny back to an assailant. The E. is capable of very long abstinence, and confines itself to its burrow during droughts. In confinement, it may be fed on milk, hard-boiled eggs, etc.

**ECHIMYD**, *ē-kī'mīd* (*Echimy*s): genus of rodent quadrupeds, in some of their characters agreeing with dormice, but differing from them in having the tail scaly, and the fur coarse and mingled with flattened spines. They all are S. American. Some of them are known as spiny rats. They display considerable beauty of color. One species excavates long burrows in the ground.

**ECHINATE**, a. *ēk ī-nāt*, or **ECH'INATED**, a. [L. *ēchīnus*; Gr. *ēchīnos*, a hedgehog: It *echino*; F. *échine*, a spine]:

## ECHINEIS—ECHINIDÆ.

set with prickles; prickly; bristled. **ECHINOIDEA**, n. *ěk'ī noy'dě-ă* [Gr. *eidos*, likeness]: a class of the *Echinodermata*, comprehending the marine creatures known as sea-eggs or sea-urchins (see **ECHINIDÆ**). **ECH'INITE**, n. *-nīt*, a general term for any fossil sea-urchin, or part of one. **ECHINOBRIS'SUS**, genus of echinoids, the typical one of the family *Echinobrissidæ*. **ECHINUS**, n. *ě-kī'nūs*, a sea-hedgehog; a sea-urchin; a prickly head or top of a plant; an ornamental molding with oval spaces. **ECHINOCOCCI**, n. plu. *ě kīn'ō kōk'sī* [Gr. *kokkos*, a berry]: the larval forms of the tapeworm of the dog. sing. *Echinococcus* (see **TAPE-WORM**). **ECHINODERM**, n. *ě-kīn'ō-děrm*, **ECHIN'ODER'MATA**, n. plu. *-děr'mă-tă*, or **ECHIN'ODERMS**, n. plu. *-děrmz* [Gr. *derma*, skin]: a sub-kingdom of invertebrates, like the star-fish and sea-urchin, all less or more covered with a firm crustaceous substance, often densely armed with spines. **ECHIN'ODER'MAL**, a. *-măl*, relating to the echinodermata. **ECHINOLAMPAS**, n. *ě-kī-nō-lămpas* [Gr. *lampas*, a torch]: genus of echinoids, the typical one of the family *Echinolampadæ*; in *paleon.*, range from Tertiary period till now. **ECHINONIDÆ**, n. *ě-kī-nōn'ī-dě* [mod. L. *echinoneus*]: a family of irregular echinoids, the only fossil genus of which, *Pyrina*, is of Cretaceous age. **ECHINOPÆDIUM**, n. *ě-kīn'ō-pědī-ŭm* [Gr. *paidŏn*, a child]: the embryo or larva of the echinodermata. **ECHINORHYNCHUS**, n. *ě-kī-no-rīng'kūs* [Gr. *rhunghos*, a snout, a muzzle]: genus of entozoa which contains the most noxious of the intestinal parasites, but happily none of them infest man. The largest species (*E. gigas*) is found in the intestines of the hog. Many others, not a few microscopic, are found in the intestinal canal of fishes. **ECHINOTHURIA**, n. *ě-kī-no-thūr'ī-a* [Gr. *thura*, a door]: genus of echinoids, typical of the family *Echinothuridæ*, with regular tests, but with the plates so overlapping each other as to render the whole structure flexible; in *paleon.*, its range is from Cretaceous times till now. **ECHINOZOA**, n. *ě-kī-no-zō'a* [Gr. *zoon*, a living creature]: name given by Prof. Allman to the sub-kingdom of animals, called by Prof. Huxley *Annuloida*. **ECHINULATE**, a. *ě-kīn'ū-lăt*, possessing spines.

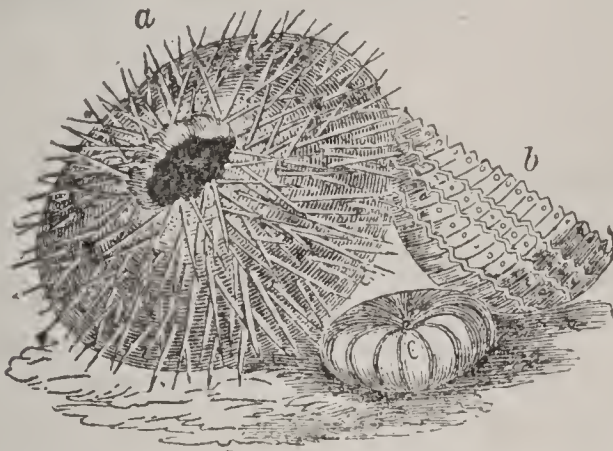
**ECHINE'IS**: see **REMORA**.

**ECHINIDÆ**, *ě-kīn'ī-dě*, or **ECHINOIDEA**: class of *Echinodermata*, the species of which are popularly known as sea-urchins, sea-eggs, etc. They have the body covered with a calcareous crust or shell, of extremely porous structure (thus differing very widely from the shells of mollusks), in polygonal plates nicely adapted to each other, and increasing by additions to the edges of each plate, so that the shell may enlarge with the enlargement of the animal, while new plates also are added around the superior orifice. The shell is pierced with rows of holes for the ambulacra (q.v.), and is externally covered in a living state with a membrane—sometimes very delicate, sometimes thick and spongy—which communicates by many delicate processes with the interior, and unites the bases of all the spines. The spines differ very much in the differ-



## ECHINOCACTUS—ECHINOCEREUS.

ent genera and species, in their length, strength, number, and arrangement; they are attached to tubercles on the surface of the shell, by cup-like bases capable of working upon the tubercles, in the manner of a ball-and-socket joint; and they are moved by means of the connecting membrane so as to be employed in locomotion. In some species, they seem to be the principal organs of locomotion; in others, the ambulacra are so. By means of the spines, some, in which they are few and strong, can walk even on dry ground; others, in which they are minute and very numerous, employ them in burying themselves in the sand. The mouth of the E. is situated at the lower orifice of the shell, and is generally furnished with five flat calcareous teeth, moved by a very complex apparatus of bony sockets and muscles—‘a very powerful mill’ for grinding down their food, which is supposed to consist of small crustaceans and mollusks. The intestine is long and spiral;



*a*, *Echinus Esculentus*; *b*, portion with spines removed; *c*, mouth

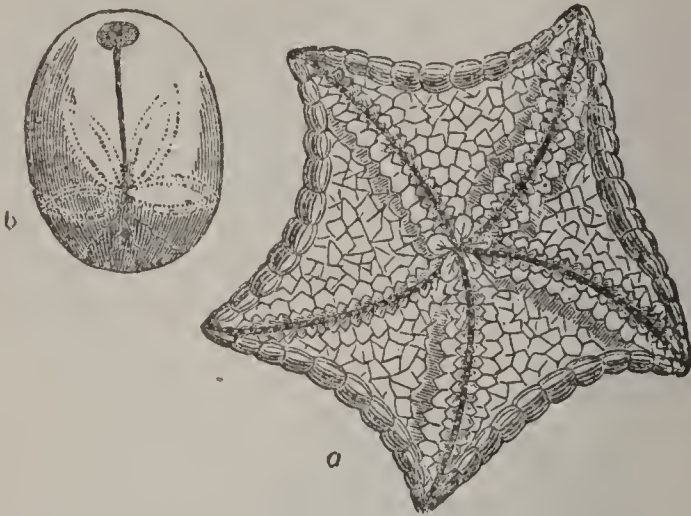
the vent, in the E. of most regular form, is at the upper end of the shell, exactly opposite the mouth; in others in which there is a departure from the characteristic orbicular form, it is more or less lateral. The E. abound in all seas, and seem to have abounded still more in former geological periods. ‘Of all the *Radiata*, they are most perfectly preserved in a fossil state,’ and the knowledge of their habits and organization is necessary to the geologist, ‘in order to understand the relations and associations of the numerous species which abound in many of the earth’s strata.’—Forbes.

**ECHINOCACTUS**, n. ě-kī-no-kāk’tūs [L. *echīnus*: Gr. *echinos*, a hedgehog: L. *cactus*; Gr. *kaktos*, a prickly plant, apparently the Spanish Artichoke or Cardoon, *Cynara Cardunculus*. This is not the modern Cactus genus]: in bot., genus of *Cactaceæ*, the typical one of the family *Echinocactidæ*.

**ECHINOCEREUS**, n. ě-kī-no-sēr’e-ūs [Gr. *echīnos*, a hedgehog; mod. L. *cereus*]: in bot., a genus of *Cactaceæ*, akin to *Cereus*, but with short instead of very long flowers. About 30 species are known; they are from Texas and Mexico.

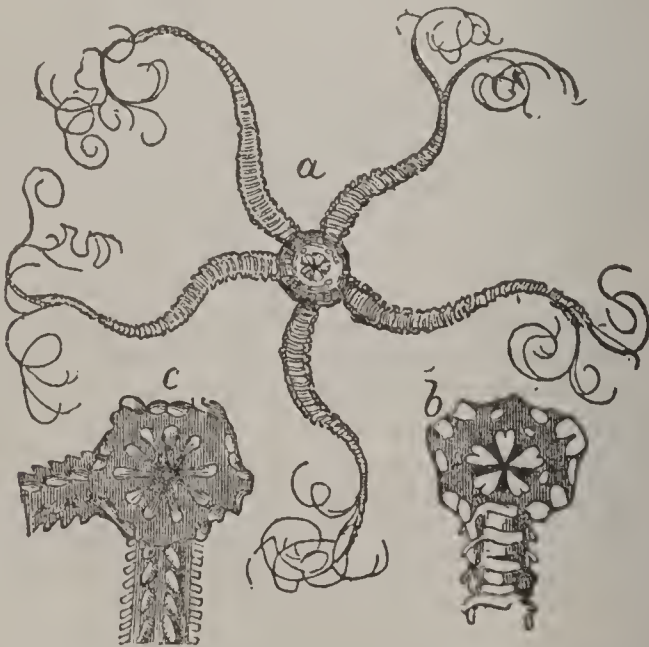
## ECHINODERMATA.

ECHINODERMATA, ě-kin'ō-dēr'ma-tā: one of the great groups or sub-kingdoms of animals (see ZOOLOGY), formerly included in the Radiata (q.v.). They have a digestive and a vascular system; for the former, however, there is in many of them only a single orifice; a circular and radiating nervous system has been observed in many; they are especially characterized by their well-organized skin,



a, *Asterias Tessellata* (*Asteriadae*); b, *Spatangus* (*Echinidae*), or sea-egg.

which in many is strengthened by calcareous plates, and in some also has the additional protection of numerous long spines. *Echinidae* (sea-urchins) exhibit these characteristics in greatest perfection. *Asteriadae* (star-fishes), *Ophiuridae* (brittle-stars), *Crinoidea*, *Holothuriadae* (sea-slugs, sea-



a, *Euryale Palmifera* (*Ophiuridae*), front view; b, disk and part of arm, front view; c, disk and part of arm, back view.

cucumbers, etc.), with many orders, also are ranked among the E., and have been variously arranged in orders by dif-



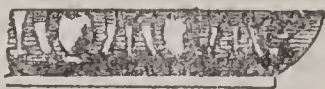
ferent naturalists. Spines are lacking in most of them; in some (*Holothurida*) the body wall contains, not exhibits, calcareous plates, and there is considerable departure from the ordinary and perfect radiate form, an approach being made to the forms of mollusks and worms, while yet the accordance with the other E. is perfect in other parts of the organization. Almost all the E. are free, moving about at the bottom of the sea; some of them—at least in an immature state—are stalked and fixed. They are provided with ‘an apparatus for water circulation,’ a peculiar characteristic of radiate animals, and which ‘can scarcely be said to exist in any of the other types.’ By means of this it is that they fill and fit for use the suckers or *Ambulacra* (q v.), with which most of them are provided for locomotion, respiration, and sensation. The spines as well as the ambulacra of the E. are used by those which possess them (*Echinidæ* and *Ophiuridæ*) as organs of locomotion.—The British E. are described by Dr. Edward Forbes in *A History of British Star-fishes*; our Atlantic coast species in monographs by Alexander Agassiz, Cambridge, Mass.

**ECHINOPHORA**, n. ě-kĩ-nŏf'ěr-a [Gr. *ěchĩnos*, a hedgehog; *phoros*, bearing, carrying]: prickly samphire, genus of *Umbelliferæ*, family *Smyrnidæ*.

**ECHINOPS**, n. ě-kĩ'nŏps [Gr. *ěchĩnos*, a sea-urchin; *ops*, the eye, the face, the countenance]: in *bot.*, genus of composite plants, typical of the sub-order *Cynareæ*.

**ECHINOSPERMUM**, n. ě-kĩ-no-spér'măm [Gr. *ěchĩnos*, a hedgehog; *sperma*, seed]: in *bot.*, genus of *Boraginaceæ*, tribe *Cynoglosseæ*.

**ECHINUS**, ě-kĩ'nūs, of Vitruvius: classical molding in the form of a series of eggs, whence it is called also the ovolo or egg-molding. The eggs are sometimes divided by an anchor or dart, as in the accompanying example. The type of this ornament is sometimes said to have been the chestnut and shell.



Echinus or Egg and Anchor Molding.

**ECH'IUM**: see VIPER'S BUGLOSS.

**ECHO**, n. ěk'ŏ [L. or Gr. *ěchŏ*, a sound: in *anc. myth.*, a nymph who pined away into a sound for love of Narcissus]: sound, as of a voice, reverberated or returned to the ear from an opposite hill, wall, etc.; a repeated sound: V. to send back a sound; to be sounded back. **ECH'ONG**, imp. **ADJ.** sending back sound. **ECHOED**, pp. ěk'ŏd, returned, as an echo. **ECHOMETRY**, n. ě-kŏm'ě-trĩ [Gr. *metron*, a measure]: the art of measuring the length of sounds. **ECHOM'ETER**, n. -tér, an instrument for measuring the duration of sounds, and their intervals.—Sound is produced by waves or pulses of the air; when such a wave comes against a wall or other opposing surface, it is reflected like light, and proceeds in another direction, and the sound so heard is an echo. Even the surface of a cloud suffices to reflect sound, as may be observed during thun-

## ECHO.

der and the discharge of cannon. That the echo of a sound may return to the point where the sound originated, the reflecting surface must be at right angles to a line drawn to it from that point. Oblique walls send the echoes of a person's voice off in another direction, so that they may be heard by others, though not by him. In order to echo words distinctly, the reflecting surface must on the whole be even, or so curved as to resemble a concave mirror. This last form is necessary for returning a distinct sound when the distance is considerable. A great degree of evenness, however, is not essential, as it is no uncommon thing for the edge of a wood to return an echo. The distance of the reflecting surface must also be such as to allow a sufficient time to elapse between the sound and the return of the echo for the ear to distinguish them; when they succeed too closely, they merge into one. An interval of about  $\frac{1}{9}$  of a second is necessary to discriminate two successive sounds; so that if we assume 1,125 ft. as the distance traversed by sound in a second,  $\frac{1}{18}$  of 1,125, or 62 ft., will be the least distance at which an echo can be heard, as the sound will go that distance and return in  $\frac{1}{9}$  of a second. If the distance is less, the echo only clouds the original sound, but is not heard as distinct. It is these indistinct echoes that interfere with hearing in churches and other large buildings (see ACOUSTICS); hence anything that breaks the evenness and continuity of the reflecting surfaces is an improvement in this respect. The number of syllables that any particular echo will repeat, depends upon how many can be uttered in the time that the sound takes to go and return from the reflecting surface. The echo at the tomb of Metella, in the Campagna, near Rome, of which Gassendi speaks as repeating a hexameter line requiring  $2\frac{1}{2}$  seconds to utter it, must therefore come from a distance of about 1,500 ft. Such echoes are rare, as the various conditions are seldom all fulfilled. When there happen to be several reflecting surfaces at different distances in the direction of the sound, with a sufficient interval between them, each gives a separate and distinct echo. A similar effect is produced when two surfaces are inclined to each other in such a way as to give repeated reflections of the sound from the one to the other like the mirrors of a kaleidoscope, thus multiplying echoes of echoes. To this multiple and repeating class belong the famous echoes of Killarney, and that produced between the wings of the castle of Simonetta, near Milan, which repeats the report of a pistol 60 times.—ECHO, in Music, repetition of a melodic phrase, frequently written for the organ, on account of the facility with which it can be produced by the stops.

ECHO, n.: in *myth.*, nymph, daughter of Aer and Telus. She was one of Juno's attendants, but, according to one legend, her loquacity having displeased Jupiter, of whose amours she had become cognizant, she was deprived of the power of speech by Juno, and only permitted to answer questions. She fell in love with Narcissus, and her love being slighted, she pined away, and was changed into a stone, which still retained the power of voice: in



## ECHO CAÑON—ECK.

*astron.*, an asteroid, the 62d found; discovered by Ferguson, 1860, Sep. 15.

**ECHO CAÑON**, *ĕk'ō kăn'yōn* or *kân'yōn*: one of the remarkable ravines of Utah Terr., in Summit co.; on the Union Pacific railroad, near Echo City and the Weber river; about 40 m. s.e. of Ogden, 40 m. n.e. of Salt Lake City, 975 m. w. of Omaha. It is inclosed by high and almost perpendicular walls of rock, and is the centre of a panorama of exceptional grandeur.

**ECIJA**, *ā'thē-čhá*: city of Spain, Andalusia, province of Seville. 45 m. e.n.e. of the town of Seville, on the left bank of the Jenil, lat. 37° 33' n., long. 5° 8' w. It is surrounded by gardens, and stands in the centre of a district fertile in corn and oil. It is well-built and prosperous. On account of the heat of the climate, this town is called by the Spaniards the Oven of Andalusia. E. has many pleasant alamedas (public promenades), shaded by trees, and adorned with statues and fountains; the principal promenade is along the banks of the river. E. was called in ancient times *Astigis*, and was one of the chief cities of the Roman province of Hispania Bœtica; its origin is unknown. It is said to have been visited by the Apostle Paul, a gilt statue of whom is in the city. E. was called *Colonia Augusta Firmā* by the Romans, and abounds in Roman antiquities. It also presents several specimens of Moorish architecture in the shape of gates and massive towers.—Pop. (1884) 25,074.

**ECK**, *ĕk*, JOHANN MAYR VON: adversary of Luther: 1486–1543; b. at Eck, a village in Swabia, where his father, Michael Mayr, was a peasant, and afterward a bailiff. Endowed with considerable ability, young Eck commenced at an early period the study of the Church Fathers and the Scholastics and acquired great skill in theological disputation. In 1518, when his *Obelisci* appeared in opposition to Luther's *Theses*, he was doctor of theology, canon of Eichstädt, and pro-chancellor of the Univ. of Ingolstadt. The publication of his *Obelisci* involved him in a disputation with Karlstadt, which lasted 1519, June 27–July 16. The only effect of the disputation on the people was to make them wonder at E.'s volubility; but having impugned some of Luther's views in the course of his disputation, he was assailed by the great Reformer, and by Melancthon. Eck nicknamed his opponents *Lutherans*, and instigated, partly by personal hatred, and partly by Fugger (q. v.), went to Rome 1520, to induce the pope to take strong measures against Luther. He returned with a papal bull of condemnation in his pocket, but the people in many places stood by Luther; and at Leipsic, in particular, Eck was so roughly received, that he had to take refuge in the monastery of St. Paul's. Later he was at the Augsburg Diet of 1530, where he let slip out the memorable statement, that 'with the Church Fathers, he would venture to oppose the Augsburg Confession, but not with the Scriptures.' In the religious convocations held at Worms 1540, and at Ratisbon 1541, he took part. A desire

## ECKERMANN—ECKFORD.

to shine and to play an important part in the affairs of men, coupled with a strong love of lucre, were the leading features of his character. Though an extremely learned ecclesiastic, he had no great talent, but was loud, boisterous, and full of assurance.

ECKERMAN, *ék'ér-mán*, JOHANN PETER: 1792–1854, Dec. 3; b. Winsen on the Luhe, Hanover: known to the literary world through his intercourse with Goethe. He studied, 1821–23, at Göttingen, and afterward went to Weimar, where he took part in the editing of the last vol. of Goethe's *Sämmtliche Werke*. At the same time, he commenced to contribute articles to the *Morgenblatt*, on Art and Antiquity. In 1827, the Univ. of Jena conferred on him the degree PH. D. Two years later, he was appointed to superintend the studies of the heir to the grand duchy of Weimar, in the German and English languages and literature. In 1830, he travelled with Goethe's son in Italy, and on the death of the patriarch of German literature, he edited his posthumous writings. During 1839–40, he edited a new edition of Goethe's *Sämmtliche Werke*, 40 vols. But E. is known most widely and favorably by his *Gespräche mit Goethe* (Conversations with Goethe). The greater part of these *Gespräche* appeared at Leipsic 1836, the remainder at Magdeburg 1848. It cannot be said with truth that E. has done for Goethe what Boswell did for Johnson, because Goethe did not require this. Johnson's writings give us but a faint idea of the man; hence Boswell's *Life* is like a revelation; whereas there was the most perfect harmony in Goethe between the man and the author. Still, E.'s book is of great value, because it shows this harmony, giving, as it does, a picture of Goethe in his manifold social and literary relations, and manifesting the simple, natural, and noble principles on which he studied and wrote. The *Gespräche* have been translated into all European languages, even into Turkish. The best English translation is by John Oxenford (Lond. 1850). E. died at Weimar.

ECKERT, *ék'ért*, THOMAS THOMPSON: b. St. Clairsville, O., 1825, Apr. 23: telegrapher. He constructed the telegraph line between Pittsburg and Chicago, and became its supt. 1852; organized and managed the entire system of the military telegraph during the civil war; was asst. sec. of war 1864–66; brevetted brig.gen. 1865; was appointed gen. supt. e. division of the Western Union Telegraph Company 1865; organized the Atlantic and Pacific Company 1874, and the American Union and the American Telegraph and Cable Companies 1880; and became vice-pres. and gen. manager of the Western Union 1881, and pres., 1893.

ECKFORD, *ék'ford*, HENRY: 1775, Mar. 12—1832, Nov. 12; b. Irvine, Scotland: naval architect. He became a ship builder in New York 1796, designed and constructed a fleet of war vessels for the U. S. govt. 1812–14, built the *Robert Fulton* which made the first voyage by steam to New Orleans and Havana, became naval constructor at the Brooklyn navy yard 1820, resigned. and built several war vessels for European and S American govts., and, entering



## ECKHART.

the service of Turkey, built the navy yard at Constantinople 1831.

ECKHART, *ĕk'hârt*, JOHANNES: 1260–1329; b. Strasburg: father of German mysticism. He studied theology and philosophy in Paris, entered the Dominican order in Rome, and became prior in Erfurt, vicar-gen. in Bohemia, prior in Frankfort-on-the-Main, and provincial in Cologne. He introduced many reforms into the monasteries of his order, and in his sermons gave expression to such extreme mysticism that he was accused of heresy by Abp. Henry while at Cologne 1327, taken before a tribunal of the Inquisition, and had 28 sentences in his sermons condemned by a papal bull 1329, which also declared that he had recanted before his death. Against this alleged recantation, some of his followers produced a document, dated 1327, Feb. 13, which contained his vigorous protest against a malicious interpretation of some isolated passages in his sermons, and his declaration that his doctrines had never gone beyond the bounds of orthodoxy. He was regarded by his contemporaries as one of the profoundest thinkers of all ages, and one of the greatest of German writers. The starting point of his doctrine is that, apart from God, there is no real being. But, in his view, God is the unknown. He conceives of the Godhead, as without any thing that can be affirmed concerning it. Any thing definitely ascribed to it would limit and therefore destroy its infinity. The Godhead is not God as known to us. From it proceeds the triune God, who is known. The *essence* or Being of the Godhead is what it is in itself; its *nature* is that which it becomes as an object for others. It reveals itself in the personal God, the Father. The Son is the word or expression through and in which the Father becomes self-conscious. The Father eternally begets the Son, and the Son's return into the Father in love and mutual will is the Spirit. The Father is not before the Son; only through the begetting of the Son, only through arriving at self-consciousness, does he become the Father. The genesis of the Son from the Father involves also the production of the world of things; for God is reason, and in reason is contained the ideal world of creatures. In the Son all things are made in ideal form. As all things have arisen from God, so they all tend to return to him. Repose in him is the end of all things; and in man, the noblest of creatures, this end is realized. In him specially, there is the power of reaching to the absolute, the ground both of God and the universe. This power—which E. called *the spark*—is in truth God working in man. In man's act of cognition of God, God and man are one; there is no distinction of knower and known. Union with God—the birth of the Son in the soul—is the ultimate end of activity, and is to be attained by resigning all individuality. When this is reached the soul is one with God; its will is God's; it cannot sin. Yet all this applies only to the 'spark' in the soul, the other powers of which may be properly employed about other things. Thus, the way is left open to adjust the balance between feeling and action; between philosophical theory and prac-

## ECKHUNG CHOO—ÉCLAT.

tical life. In Eckhart's theories appear at least the elements of some modern metaphysical speculations. A collection of all his writings that have been preserved has been published in the 2d vol. of Pfeiffer's *Die Deutschen Mystiker* (Leipsie 1857).

ECKHUNG CHOO, *èk-kúng' chò*: river of Tibet, supposed the head stream of the Indus. It rises on the n. side of the Himalaya, near the sourees of the Sutlej. The actual locality of its sources has been assigned to the Kailas Mountains, lat.  $31^{\circ} 25'$  n., and long.  $81^{\circ} 40'$  e. Flowing to the n.w., E. C. reaches long.  $79^{\circ}$  e. before it assumes the name of Indus.

ECKMÜHL, *èk'müt*: village on the Laber, Bavaria, notable for the battle 1809, Apr. 22, between 75,000 French and 40,000 Austrians. The Archduke Charles had taken up his position on the right bank of the Danube, near Eekmühl. From this point, at the head of four divisions of Austrian army, he threatened Napoleon, and hoped to gain possession of the road to Donauwörth, the occupation of which would have decided the fate of Bavaria. This was prevented by Davout, who, moreover, by repeated attacks, contrived to keep the archduke in ignorance of Napoleon's designs. The plan of the latter was to cut off the Austrians from their whole remaining communications with the Iser and Inn, and by throwing them back upon Ratisbon and Bohemia, as their only line of retreat, to sever them entirely from the support and protection of Vienna. Apr. 22, Napoleon suddenly appeared, with his army, opposite the village of Eekmühl. The action, on the side of the French, was commenced by Lannes, who drove back the Austrian left, while the village of E. was stormed by the Würtembergers. Soon, the high grounds between E. and Laichling, also occupied by the Austrians, were abandoned after a heroic struggle, and the archduke ordered a retreat on Ratisbon, which was admirably executed, though the defeated army was harassed by 16 cavalry regiments. During the retreat, a magnificent and thrilling encounter took place at Eglofsheim between the French and Austrian cuirassiers, which, though it ended fatally for the latter, was largely instrumental in securing the retreat of the main body of the Austrian army. The Austrians had 5,000 men killed and wounded, and 7,000 taken prisoners, besides losing 12 standards and 16 pieces of cannon. The French loss was considerably less.

ÉCLAIRCISSEMENT, n. *ā-klār'sis-mǎng'* [F.—from F. *é*, OF. *es*, for L. *ex*, out; F. *clair*, clear—from L. *clārus*], the clearing or explaining any thing or affair not before understood: explanation; *dénouement*.

ECLAMPSY, n. *èk-lǎmp'si*, or ECLAMP'SIA, n. *-sǐ-ă* [Gr. *eclampsis*, a shining forth—from *ek*, forth, from; *lampein*, to shine]; an appearance of flashing of light which attends epilepsy; any form of epilepsy or other convulsive disease: see CONVULSION.

ÉCLAT, n. *ā-klá'* [F. *éclat*, an explosion, sudden splendor—from *éclater*, to fly into fragments], sudden splen-



## ECLECTIC—ECLECTICS.

dor or brightness; applause; show; pomp; striking effect.

ECLECTIC, *n.* *ĕk-lĕk'tĭk* [Gr. *eklek'tikōs*, selecting—from *ek*, out of, *lego*, I choose or gather: F. *éclectique*]. choosing or selecting, as opinions or doctrines: N. any philosopher in anc. times who selected his opinions and principles from various sources. ECLECTICALLY, *ad.* *-lĭ*. ECLECTICS, *n. plu.* *-tĭks*, a sect of philosophers; a certain sect of Christians; in *Amer.*, a school of medical practitioners. ECLECTICISM, *n.* *-tĭ-sĭzm*, the principles or doctrines of the Eclectics.

ECLECTICS, *ĕk-lĕk'tĭks*—ECLECTICISM, *ĕk-lĕk'tĭ-sĭzm*: a school of philosophers, and their philosophic system. Eclectics was the name given in ancient times to those philosophers who had no determinate system of their own, but who professed to choose (*eklegein*) from all systems the parts that they considered true. They arose about the end of the 2d century. The systems from which the selections were originally made were those of Pythagoras, Plato, and Aristotle, but ultimately eclecticism lapsed into an attempt to reconcile Platonism and Christianity; and the latter application of the term eclectic was to one who was engaged in this attempt. The chief representatives of this school were Plotinus and Proclus, who, however, did not so much make up a compound of doctrines gathered from without, as set up a view that endeavored to unite the results of previous systems into a consistent whole. Many of the early Fathers of the Christian Church who had been educated in the pagan schools of philosophy and rhetoric, and retained a fondness for their early studies, were eclectics, such as Clemens Alexandrinus, and Synesius of Cyrene. A prominent upholder of this system was Ammonius Saccus, who laid the foundation of that sect of philosophers afterward known as the New Platonists, in the Alexandrine school: see NEO-PLATONISTS. The term eclectic has had a still later application. Modern eclecticism is conceived by some to have originated with Bacon and Descartes, but Hegel may be more properly considered its founder. In his *Philosophy of History* and other works, he endeavors, among other things, to point out the true and false tendencies of philosophic speculation in the various ages of the world; but it is to the lucid and brilliant eloquence of Victor Cousin (q.v.) that modern eclecticism owes its popularity. This system, if it can be so called, may best be defined as an effort to expound, in a critical and sympathetic spirit, the previous systems of philosophy. Its aim is to apprehend the speculative thinking of past ages in its historical development, and it is the opinion of some that such a method is the only one possible in our day in the region of metaphysics.

## ECLECTIC SCHOOL OF MEDICINE.

ECLECTIC SCHOOL OF MEDICINE, AMERICAN: system of med. theory and practice. It makes profession of adopting whatever in materia medica or in therapeutics is proved to be of value, and of modifying its practice in accordance with every new discovery in the medical art. It holds the doctrine of 'specific medication,' the specifics being directed not against symptoms, but against specific pathological conditions: the morbid products of such conditions are held to be excreted by the action of the specifics. The first eclectic med. college in the United States, the New York Reformed Med. College, was founded by Dr. Wooster Beach, 1826; the next was founded at Worthington, O., 1826; this also was called a reformed med. college, but when the Worthington school was transferred to Cincinnati, 1843, it assumed the style Eclectic Med. Institute. Hence the Cincinnati institute is regarded as the parent school of eclectic medicine; it still exists in a flourishing condition. To Dr. John M. Scudder of the eclectic med. institute of Cincinnati is due the doctrine of specific medication accepted by the eclectic school. By the middle of the 19th c. colleges of eclectic medicine had been established in many cities in the east and in the west; state med. societies also of the eclectic school were formed at an early date; the National Eclectic Med. Assoc. was incorporated by the legislature of N. Y. 1870. But the E. S. M. holds a less prominent place now than it did in the middle of the century. Its statistics showed (1884) 9 colleges or institutes, two of them in N. Y.: in the same year, besides the institute in Cincinnati, there were colleges in Chicago, St. Louis, Atlanta, and Oakland, Cal. Of the N. Y. eclectic med. colleges, one, having 9 professors, graduated 19 students; the other, with 19 professors, graduated 33 students.



## ECLIPSE.

**ECLIPSE**, *n.* *ē-klīps'* or *ě-klīps'* [*F. éclipse*—from *L. eclipsis*; *Gr. ekleipsis*, a forsaking, a being absent, an eclipse—from *Gr. ek*, out; *leipo*, I leave: *It. eclisse*]: the phenomenon of a celestial body disappearing from view in whole or in part, in consequence of another celestial body, or its shadow, passing between it and the spectator, darkness. **V.** to hide or conceal a luminous body in whole or in part; to cloud or darken; to disgrace. **ECLIP'SING**, *imp.* **ECLIPSED'**, *pp.* *-klīpst'*, concealed; darkened; outshone. **ECLIPSA'REGN**, a contrivance invented by the astronomer Ferguson for exhibiting the time, quantity, duration, and progress of solar eclipses. **ECLIP'TIC**, *n.* *-tik*, the apparent path of the sun in the heavens in a year—so called because an eclipse cannot take place unless the moon be in or near the ecliptic.

**ECLIPSE**: obscuration of one of the heavenly bodies by the interposition of another, either between it and the spectator, or between it and the sun. The causes of eclipses, as suggested in this definition, are so simple and familiar, that it is difficult for us to imagine how deeply eclipses affected men's minds before the dawn of astronomical science. To the ancients, they were events outside the order of nature—terrible presages of dire events; and at Rome, at one time, it was blasphemy, and punished by law, to talk publicly of their being due to natural causes. So strong a hold had this superstition on the popular mind, that even after it came to be generally believed that eclipses of the sun were caused by the moon coming between us and that orb, eclipses of the moon were still referred to supernatural agency. When the moon was in *E.*, the people turned out and made a great noise with brazen instruments—the idea being, that by doing so they gave her ease in her affliction. According to some, Luna, when in *E.*, was in the pains of labor; according to others, she was suffering from the arts of wicked magicians. Similar notions have prevailed among all barbarian tribes. The Chinese, it is well known, imagine eclipses to be caused by great dragons trying to devour the sun and moon, and accordingly they beat drums and brass kettles to terrify the monsters into letting go their prey. Several stories are told of these popular superstitions being turned to good account by knowing persons; among which are those which represent Thales as bringing about peace between the Medes and Lydians; and Columbus, when in a great strait, procuring provisions from the natives of Jamaica through the prediction of eclipses.

Stars, planets, and the satellites of planets, may suffer eclipse. The principal eclipses, however, are those of the sun and moon, called the solar and lunar eclipses. The transits of the lower planets over the face of the sun are partial solar eclipses; but solar eclipses, properly so called, are those caused by the interposition of the moon between the sun and earth. Regarding solar eclipses, it is observed that they happen always at the time of new moon, when the sun and moon are in conjunction, i.e., on the same side of the earth. In a partial eclipse, the sun's disk suddenly loses its circular form; it becomes indented on one side, the

## ECLIPSE.

indentation slowly increasing for some time, and then diminishing until it disappears altogether. In a total eclipse, the indentation goes on increasing till the whole orb for a time disappears; after a short interval, the sun reappears again, passing through the same phases of obscuration in an inverse order. In an annular eclipse, the whole orb is obscured except a ring or annulus. Lunar eclipses, again, it is observed, happen always at full moon, or when the sun and moon are in opposition, or on opposite sides of the earth, and are caused by the moon passing through the earth's shadow. Such eclipses are sometimes partial, and sometimes total, but never annular, and in their general phases they resemble those of the sun.

In speaking of eclipses, certain terms are used. The *duration* of an E. is the time of its continuance, or the interval between immersion and emersion. *Immersion* or incidence of an eclipse is the moment when part of the luminary begins to be obscured; *emersion* or *expurgation* is the time when the luminary begins to reappear or emerge from the shadow. When the quantity of an eclipse is mentioned, the part of the luminary obscured is intended. To determine this part, it is usual to divide the diameter of the orb into twelve *digits*; and the eclipse is said to be of so many digits, according to the number of them contained in that part of the diameter which is obscured.

1. *Eclipses of the Moon*.—It has been said that these are caused by the moon passing through the earth's shadow. Before this explanation can be accepted, it must be shown that that shadow extends as far as the moon. This is easily done. Supposing the earth to have no atmosphere, then the shadow is the cone marked in shade in fig. 1, whose apex is at O; and the question is, whether the distance OT from the apex to the earth's centre exceeds the moon's average distance from the earth. Drawing TB, SA, from the centres of the earth and sun respectively, perpendicular to the line OBA, touching both spheres, and the line TC parallel to the line OBA, we have from the similar triangles

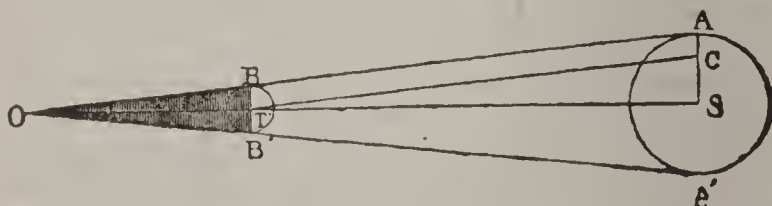


Fig. 1.

OTB, TSC, the proportion  $OT : TB :: TS : SC$ . Now, we know that TS, the (mean) distance of the sun, is equal to about 24,000 times TB; also, from the construction,  $AC = TB$ ; and we know that  $SA = 112$  times TB, whence it follows that  $SC = 111$  times TB. The above proportion, then, gives  $OT = 216$  times TB, since  $\frac{24000}{111} = 216$  nearly. But the moon's average distance is only 60 times TB (the earth's radius). Hence it appears that the length of the earth's shadow is almost four times the average distance of the moon, and that the moon can enter it. Further, it is clear



## ECLIPSE.

that, should it do so, it may be totally obscured; for it must enter at a point much nearer T than half the distance OT, which is 108 times TB; and everywhere within that distance it might be shown the breadth of the shadow is much greater than the moon's disk. But one consideration remains to complete the proof of the theory of lunar eclipses. It was mentioned that they occur only at full moon, and we know that to be the only time when the earth is between the sun and moon, and so *has a chance* of throwing her shadow upon it. Why they do not occur every full moon, will be explained in treating of the prediction of eclipses.

In the foregoing explanation, we proceeded on the assumption that the earth has no atmosphere. If the assumption were correct, the earth's shadow would be darker and narrower than it is, and the phenomena of eclipses of shorter duration, but more striking. The effect of the atmospheric refraction (see REFRACTION) is to bend the rays which are incident on the atmosphere in toward the axis of the cone of the earth's shadow, those which pass through the lowest strata of the air being most refracted, and converging to a point in the line OT (see fig. 1), at a distance equal 42 radii of the earth from the earth's centre. Accordingly, the moon, which, as we have seen, crosses the shadow at a distance of about 60 radii, never enters that part of it which is completely dark; thus, she never loses her light entirely, but appears of a distinct reddish color resembling tarnished copper—an appearance caused by the atmospheric refraction, in the same way as the ruddy color of the clouds at

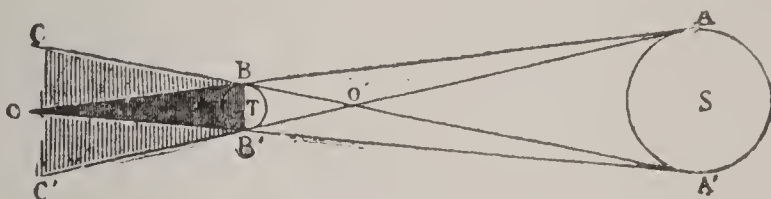


Fig. 2.

sunset. There is another reason why the phenomena of a lunar eclipse are less striking than, from the explanation given relative to fig. 1, might be expected. Every shadow cast by the sun's rays necessarily has a penumbra, or envelope, on both sides of the half-shadow. In the case before us (fig. 2), suppose a cone having its apex O' between the sun and earth, and enveloping each of them respectively in its opposite halves, CO'C' and AO'A' (fig. 2). It is clear that from every point in the shaded part of the cone CO'C', and without the shadow BOB', a portion of the sun will be visible—and a portion only—the portion increasing as the point approaches either of the lines CB, C'B; and diminishing as it approaches the lines BO, B'O. In other words, the illumination from the sun's rays is only partial within the space referred to, and diminishes from its extreme boundary lines toward the lines BO, B'O. When, then, the moon is about to suffer eclipse, it first loses brightness on entering this penumbra; so that when it enters the real shadow, the con-

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trast is not between one part of it in shade and the other in full brilliancy, but between a part in shade and a part in partial shade. On its emersion, the same contrast is presented between the part in the umbra and the part in the penumbra. What we should expect on this geometric view of the earth's shadow, actually happens. From the breadth of the penumbra, it happens that the moon may fall wholly within it before immersion in the umbra commences; and so softly do the degrees of light shade into one another, that it is impossible to tell when any remarkable point on the moon's surface leaves the penumbra to pass into the umbra, or the reverse.

2. *Prediction of Lunar Eclipses.*—It was stated above that lunar eclipses happen only at full moon. They do not happen every full moon, because the moon's orbit is inclined to the ecliptic, on which the centre of the earth's shadow moves at an angle of  $5^{\circ} 9'$  nearly. Of course, if the moon moved on the ecliptic, there would be an eclipse every full moon; but from the magnitude of the angle of inclination of her orbit to the ecliptic, an eclipse can occur only on a full moon happening when the moon is at or near one of her nodes, or the points where her orbit intersects the ecliptic. An eclipse clearly can happen only when the centres of the circle of the earth's shadow and of the moon's disk approach within a distance less than the sum of their apparent semi-diameters; and this sum is very small; so that except when near the nodes, the moon, on whichever side of the ecliptic she may be, may pass above or below the shadow without entering in the least. The moon's average diameter is known to be  $31' 25'' 7$ , and from the *Nautical Almanac* may be ascertained its exact amount for any hour—its variations all taking place between the values  $29' 22''$  and  $33' 28''$ . As for the diameter of the circle of the shadow, it is easily found by geometric construction and calculation, and is shown to vary between  $1^{\circ} 15' 32''$  and  $1^{\circ} 31' 36''$ ; and its value for any time may be found from the *Nautical Almanac*, to which value astronomers usually add  $1'$  as a correction for its calculation proceeding on the assumption that the earth has no atmosphere. Starting from these elements, it is a simple problem in spherical trigonometry—which may be solved approximately by plane trigonometry by supposing the moon and the earth's shadow to move for a short time near the node in straight lines—to fix the limits within which the shadow and moon must concur to allow of an eclipse. Recollecting that the earth's shadow on the ecliptic is at the opposite end of the diameter from the sun, and that therefore as it nears one node the sun must approach the other—the sun and shadow being always equidistant from the opposite nodes—we find, from the solution of the above problem: 1. That if, at the time of full moon, the distance of the sun's centre from the nearest node be greater than  $12^{\circ} 3'$ , there cannot be an eclipse. 2. If at that time the distance of the sun's centre from the nearest node be less than  $9^{\circ} 31'$ , there will certainly be an eclipse. 3. If the distance of the sun's centre from a node be between these values, it is doubtful whether there will be an eclipse,



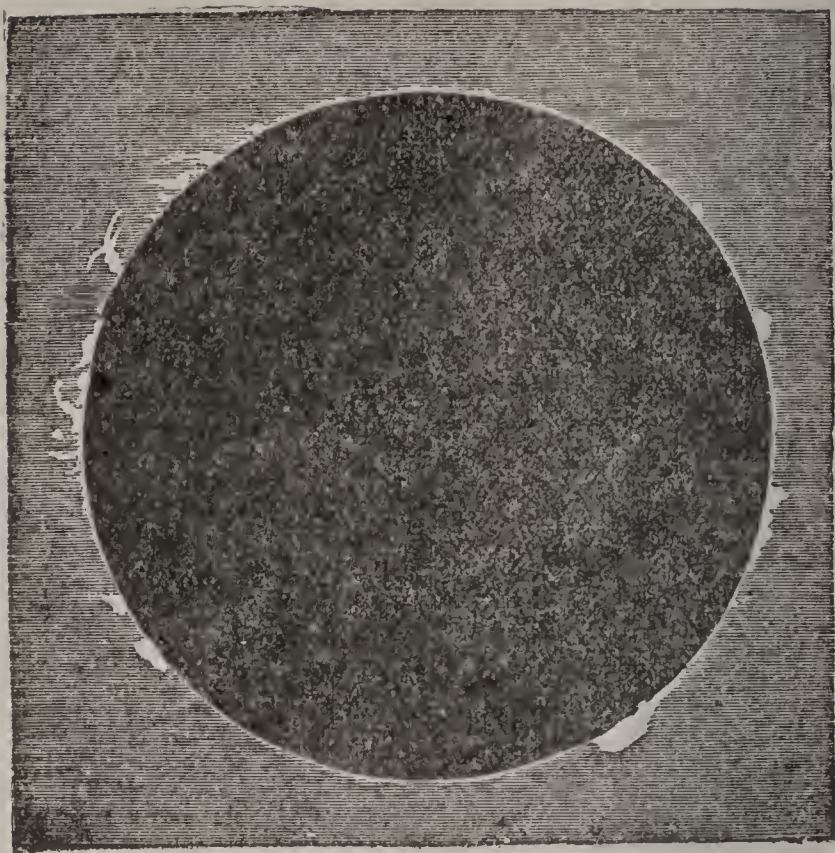
## ECLIPSE.

and a detailed calculation must be resorted to, to ascertain whether there will be one or not. Without entering into the nature of that calculation, suffice it to say that, knowing from the *Nautical Almanac* the true time of the sun and moon being in opposition, the true distance of the moon from the node at the time of mean opposition, with the true place of the sun at that time, as well as the moon's latitude, we may, by means of these elements, combined with the obliquity of the moon's path and its motion relative to that of the sun, not only know whether there will be an E. or not, but predict its exact magnitude, duration, and phases. Before the laws of the solar and lunar motions were discovered with anything like accuracy, the ancients were able to predict lunar eclipses with tolerable correctness by means of the lunar cycle (see SOLAR CYCLE) of 18 Julian years and 11 days. Their power of doing so turned on this, that in 223 lunations the moon returns *almost* exactly to the same position in the heavens. If the moon did return to *exactly* the same position, then, by simply observing the eclipses which occurred during the 223 lunations, we should know the order in which they would recur in all time coming.

All lunar eclipses are universal or visible in all parts of the earth which have the moon above their horizon, and are everywhere of the same magnitude with the same beginning and end; and this universality of lunar eclipses is the reason why it is popularly thought, contrary to the fact, that they are of more frequent occurrence than solar eclipses. The eastern side of the moon, or left-hand side as we look toward it from the north, is that which first immerses and emerges again. The reason of this is, that the proper motion of the moon is swifter than that of the earth's shadow, so that she overtakes it with her east side foremost, passes through it, and leaves it behind to the west. It will be readily understood, from the explanations above given, that total eclipses and those of the longest duration happen in the very nodes of the ecliptic. But from the fact that the circle of the shadow is much greater than the moon's disk, total eclipses may happen within a small distance of the nodes, in which case, however, their duration is less. The further the moon is from her node at the time, the more partial the eclipse is, till, in the limiting case, she just touches the shadow, and passes on unobscured.

3. *Eclipses of the Sun*, so called, are caused, as above stated, by the interposition of the moon between the earth and sun, through which a greater or less portion of the sun is necessarily hid from view. In one sense, a solar eclipse might more properly be called an eclipse of the earth, caused by the moon's shadow falling upon it.

By a process similar to that used in ascertaining the length of the earth's shadow, it can be shown that the greatest value of the length of the moon's shadow is 59.73 semi-diameters of the earth; at the same time, we know that the least distance of the moon from the earth is about 55.95 semi-diameters. It follows that when a conjunction of the sun and moon happens at a time when the length of



Total Eclipse, Observed in America August, 1869.



Edentata.—1, Skull and (3) Tooth of *Chlamydophorus truncatus*; 2, Skull of *Myrmecophaga jubata* (Great Ant-eater).



## ECLIPSE.-

the shadow and the distance of the moon from the earth are, or are nearly, equal to the values above stated, the moon's shadow extends to the earth and beyond it. Should the shadow in these circumstances fall upon the earth, there will be a total E. of the sun at all places within it or over which it moves (fig. 3). If  $L$  be the moon,  $T$  the earth, and  $abL$  the moon's shadow cast by the sun, there will be a total E. of the sun at every point that is completely within the portion  $ab$  of the earth's surface. Again, the smallest value of the length of the moon's



Fig. 3.

shadow may be shown to be 57.76 semi-diameters of the earth, and the greatest distance of the moon from the earth is 63.82 semi-diameters. Suppose the moon interposed between the earth and sun when these values concur, it is clear that the moon's shadow will fall short of the earth. In this case, the sun cannot be altogether hid from any point of the earth's surface; but this case, or one approximate to it, is that in which there will occur an annular eclipse. In the figure, suppose  $O$  to be the apex of the shadow which falls short of the earth, and conceive the cone of the shadow produced earthward beyond  $O$  into a second cone  $Ocd$ ; then from every point within the section



Fig. 4.

$cd$  of the earth's surface, the moon will be seen projected as a black disk on the middle of the disk of the sun, the portion unobscured forming a ring or annulus of light. While in the two cases just described the E. is total or annular at places within  $ab$  or  $cd$ , it will be partial at other places; the moon will appear projected against a portion of the sun's disk, making a circular indentation. To ascertain the places at which the E. will be partial, we have merely to form the cone of the penumbra of the moon's shadow in the manner explained in treating of lunar eclipses; at all places on the earth's surface within that cone there will be a partial eclipse. A simple calculation shows what is the observed fact, that the cone of the penumbra is not nearly large enough to embrace the whole of the face of the earth directed to the sun; in other words, solar eclipses are not universal, like those of the moon, i.e., they

## ECLIPSE.

are not seen from all places that have the sun above their horizon at the time of the E., which is the reason that though they are of more frequent occurrence than lunar eclipses, the latter are commonly supposed to occur more frequently.

If one could take up a position in space from which he could command a view of the whole face of the earth turned to the sun during a lunar E., the phenomena which he would observe would be somewhat as follows. Marking the point of the earth first touched by the penumbra of the moon's shadow, he would observe the obscuration spreading therefrom over a wide and wider area as the penumbra advanced, till at last, supposing him to be viewing the case of a total E., there appeared the umbral cone marking the earth with a dark spot. By and by, the whole penumbral shadow would be on the earth. The black spot would then appear to travel onward with the motion of the shadow, and in its centre, in a course determined by the composition of the proper motion of the shadow or moon, and the motion of rotation of the earth. Part of the globe would be free from the affection, and, in the course of time, the umbral spot would move over different portions of the earth in succession, till at last it passed off the earth's surface, drawing after it the penumbral shadow. Could the spectator mark on the globe the various places affected by the shadow, with their degrees of shading, he would have a perfect chart of the course of the eclipse. The small belt of the globe traversed by the umbra would mark all places at which the eclipse would be total, while the degrees of shading over places adjoining that belt on both sides would indicate the magnitude of the partial eclipse as seen from them. The breadth of the belt traversed by the umbra, when the sun's distance is greatest and the moon's least, is estimated at about 180 miles; and in the same case the penumbra is estimated to cover a circular space of 4,900 miles in diameter, the E. happening exactly at the node. If the E. does not happen at the node, it is clear that the axis of the shadow must be inclined to the plane of the ecliptic, that the shadow will be cut obliquely, and therefore that the part of the earth in shade will be oval. Astronomers usually calculate beforehand the motion of the shadow over the earth's surface, and prepare charts to exhibit its motion. Such a chart an observer from a position outside the earth would have it in his power to make from observation.

Of the commoner phenomena attending an E. of the sun, as regards the appearance of that luminary, nothing need be said; they are perfectly analogous to those of lunar eclipses, except in the case of the E. being annular. There are other appearances, however, attending an E. of the sun, especially when it is total, that are very remarkable. The almost instantaneous darkening of the orb of day, particularly when it is unlooked for, is adapted to impress a spectator with vague terror; even when expected, it is impressive as a demonstration of the forces and motions of the mechanism of the universe. The sudden darkness, too,



## ECLIPSE.

is impressive from its *strangeness* as much as from occurring by day; it resembles neither the darkness of night nor the gloom of twilight. The cone of the moon's shadow, though it completely envelopes the spectator, does not, as we have explained, inclose the whole atmosphere above his horizon. The mass of uninclosed air accordingly catches the sunlight, and reflects it into the region of the total eclipse, making there a peculiar twilight. Stars and planets appear, and animals are dismayed by the dismal aspect of nature.—See Mahoud-Bey's Report of the Total Eclipse of 1860, July. Mr. Warren De la Rue, one of an expedition of scientific men who went to Spain to witness the same E. gives the following account of the aspects of nature near the time of totality: 'When the sun was reduced to a small crescent, the shadows of all objects were depicted with great sharpness and blackness, reminding one of the effects of illumination with the electric light. The sky at this period assumed an indigo tint, and the landscape was tinged with a bronze hue.'—*Athenæum*, 1860, II. 259. At totality, there was still light enough to

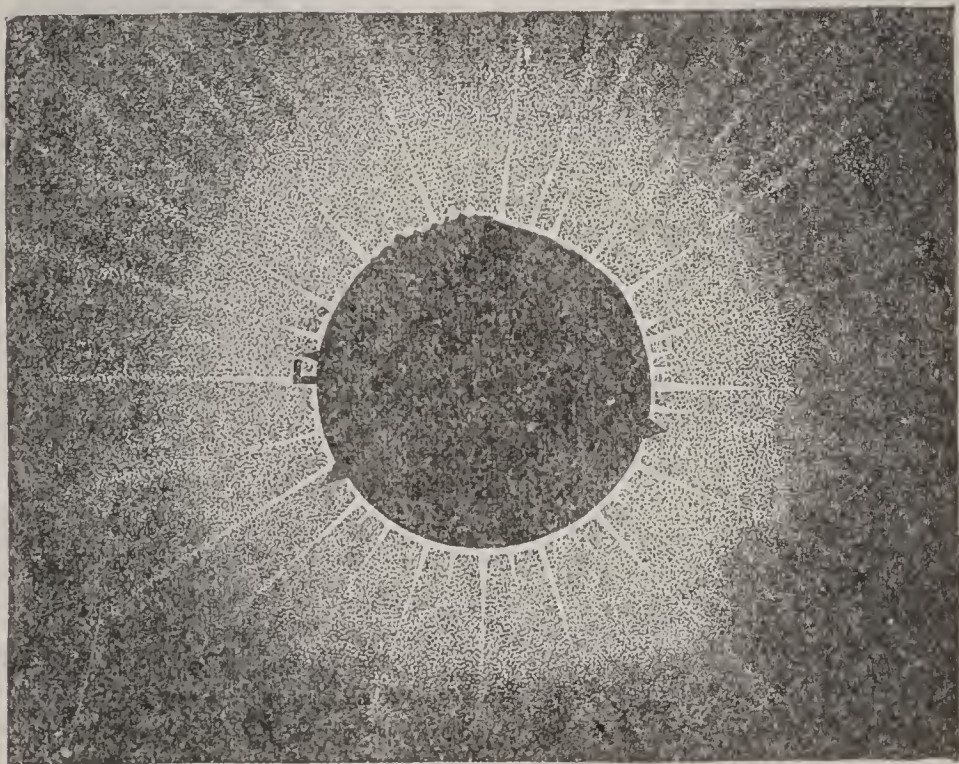


Fig. 5.—Appearance round the Sun during Total Eclipse.

enable the observer to draw without the aid of his lamp, while the sky near the sun presented a deep indigo, and thence passed through a sepia tint to red and brilliant orange near the horizon. It must be said, however, that the strange appearance here recorded is exceptional, and probably not such as could ever occur in our latitude. There is one set of phenomena attending total eclipses of the sun, which are at once strange and invariable, and the causes of which are not yet fully understood. As long as the total E. lasts, there appears round the sun and moon a

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luminous corona, as in fig. 5, while at its base, and projecting beyond the dark edge of the moon, appear very brilliant prominences, generally of a red color. These prominences were first observed during the total E. of 1842, July 8; but they are found to be constant attendants on eclipses, and methods have been invented of rendering them visible at any time without the interposition of the moon. The spectroscope reveals them to consist mainly of hydrogen gas in an incandescent state, and a comparatively narrow belt of the same color and substance runs round the whole circumference of the sun. The prominences are sometimes seen to shoot up like flames, in wild fantastic shapes, with incredible velocity, and to the height of tens of thousands of miles: see SUN.

In the E. of 1860, the light of the corona was a silvery white, and it extended beyond the moon's limb about eight-tenths of her diameter. The corona consisted first of a bright ring of about 2' wide, and then an exterior and fainter ring of about 3', beyond which, for a mean distance of about 2', extended a glory of small rays—the whole corona extending to 7' beyond the moon's limb. From the corona, at intervals, projected individual rays of remarkable size, and five in number: one of 9' length; another of 14', and shaped like the point of a star; a third, sabre-shaped, and extending 28'; a fourth, 28'; and a fifth, 10'. These individual rays are very differently described by different observers of the same eclipse, and are not well accounted for. The diffused light of the corona is believed to be caused by an immense extension of the gases forming the red envelope, only in a cooler and rarer condition.

4. *Prediction of Solar Eclipses.*—The period of 18 Julian years 11 days, referred to in treating of the prediction of lunar eclipses, applies equally to solar eclipses with lunar; but the ancients, who understood that fact, could find no law of recurrence of solar eclipses within that period, so as to predict them. The reason of the failure is obvious; for though solar eclipses recur in a fixed order within the cycle, they are not visible at the same places on their recurrence as when first observed. By modern methods, however, eclipses of the sun may be predicted, with all their circumstances of time and places of observation, with the most perfect certainty. These modern methods resemble those already generally described as applied in the case of lunar eclipses. At the time of a solar E., the sun and moon are in conjunction; they are also in or near the same node; and no E. can happen if they are further than 17" from the node, or if the latitude of the moon, viewed from the earth, exceeds the sum of the apparent semi-diameters of the sun and moon. When within these limits, it is a problem of numbers and of spherical trigonometry to ascertain the nature of E., if any, which will happen.

*The number of eclipses* of the sun and moon together in a year cannot be less than two, or more than seven; the most usual number is four, and it is rare to have more than six. The explanation of the limitation of the number of eclipses is connected with the fact, that the sun passes by both



## ECLIPSES OF THE SATELLITES—ECLIPTIC.

nodes but once in a year, except in the case of his passing one early in the year, in which case, owing to the recession of the moon's nodes, he will again pass it a little before the end of the year. From the smallness of the cone of the moon's shadow, total solar eclipses are extremely unfrequent in any one place, compared with the frequency of their actual occurrence. At Paris, there was only one total E. of the sun in the 18th c., that of 1724, and there will not be another till near the close of the 19th c. In London, not one total E. was witnessed during the 575 years, 1140 to 1715.

ECLIPSES OF THE SATELLITES: see SATELLITES.

ECLIPTEÆ, n. *ě-klip'tē-ě*: in *bot.*, sub-tribe of composite plants, tribe *Asteroidæ*.

ECLIPTIC: the great circle of the heavens round which the sun *seems* to travel, from w. to e., in the course of a year. It took its name from the early observed fact, that *eclipses* happen only when both bodies are in or near this path. A little attention about sunset or sunrise shows that the sun is constantly altering his position among the stars visible near him, leaving them every day a little further to the w.; and that this motion is not exactly e. and w., or parallel to the equator, also becomes evident by observing that the sun's height at mid-day is constantly altering. It is further observed that, twice a year, about Mar. 21 and Sep. 23, the sun is exactly on the equator. The two points of the equator on which the sun then stands are the equinoctial points, and are the intersections of the equator and ecliptic. Again, there are two days in the year on which the sun reaches his greatest and his least mid-day elevation: the first is June 21, the second Dec. 21. On these days, the sun has reached his greatest distance from the equator either way, and the points in his course where he thus seems to pause or halt in his retreat from the equator are called the solstices (*solis stationes*). These four points are distant from one another by a quadrant of the circle, or  $90^\circ$ . Each quadrant is divided in three arcs of  $30^\circ$ , and thus the whole ecliptic is divided into 12 arcs of that length, called signs of the zodiac (q.v.). These arcs or signs have been named after constellations through which the ecliptic passes. As the equinoctial points are not fixed, but recede yearly westward about 50 seconds, and in a century about  $1^\circ 23'$ , the same constellations and signs that coincided when the division of the E. took place, no longer coincide. The constellation of the Ram, for instance, which originally stood in the first arc or sign, now stands in the second, every constellation having advanced forward  $30^\circ$ , or a whole sign. Modern astronomers therefore pay little attention to these constellations and signs, but count longitudes from the existing spring equinoctial point from  $0^\circ$  to  $360^\circ$ .

Not only do the points change where the E. and equator cross each other, but the angle of their inclination, called the obliquity of the E., also is variable. It is at present nearly  $23\frac{1}{2}^\circ$ , and is diminishing at the rate of about 50

## ECLOGUE—ÉCOLE POLYTECHNIQUE.

seconds in a century. Were it to go on diminishing always, the E. and the equator would at last coincide, and the earth would then have an everlasting spring. The decrease, however, has a limit; the obliquity oscillates between two definite bounds, which it can never pass. It has been calculated that it was at its greatest B.C. 2000, and was then nearly  $23^{\circ} 53'$ . Since then, it has been decreasing, and will continue to do so till about A.D. 6600, when it will be at its least, and about  $22^{\circ} 54'$ . These slight alterations cannot sensibly affect the seasons.

The physical cause of this change of the obliquity is the action of the other planets, especially Jupiter, Mars, and Venus, on the mass of the earth. The fact of the change was known to astronomers in very ancient times; Herodotus mentions an old tradition of the Egyptians, that the E. had formerly been perpendicular to the equator—a notion into which they were most probably led by observing, for a long series of years, that its obliquity was constantly diminishing. There can be little doubt that the Chaldeans arrived at the epoch of 403,000 years before the entry of Alexander into Babylon, to which they proudly referred for their first astronomical observations, by computing the time when the E. was perpendicular to the equator, on the supposition of its obliquity diminishing  $1'$  in 100 years. Though it was not till after the discovery of the law of gravitation that the change on the obliquity could be explained, yet that it was changing was believed by many astronomers, though some doubted whether the differences in the values at different times were not due to errors of observation. The earliest known measure of the obliquity of the E. was made by Tcheou Kong, the regent of China. Among the western nations, the earliest measurements were made by Pytheas and by Eratosthenes.

ECLOGUE, n. *ěk'ľög* [L. *eclögă*; Gr. *ekľögē*, a selection—from Gr. *ek*, out of; *lego*, I choose: F. *églogue*]: a select piece; a pastoral poem presenting shepherds and shepherdesses in some ideal scene. In this department, now little entered, Spenser is the chief English example. ECLOGITE, n. *ěk'ľō ģīt*, a mineral, being a fine-grained mixture of green smaragdite and red garnet.

ECLYSIS, n. *ěk'ľī-sīs* [Gr. *ekľusis*, a release, a lowering of the voice through three quarter-tones]: in *mus.*, the flattening of sounds to adapt them to a change of key-note.

ÉCOLE POLYTECHNIQUE, *ā-kol pol-ľī-těk-nĭk*: one of the most celebrated military academies in France. In 1793, all the public establishments in Paris were in a convulsed state, owing to the Revolution. In 1794, M. Lamblardie, director of the *Ponts et Chaussées* proposed the establishment of an *École Centrale des Travaux Publics*, to educate young men for military, naval, and civil engineering. Monge and Carnot favoring his plan, a school was established at the Palais Bourbon. The first list of professors comprised names which afterward acquired European celebrity—including those of Lagrange, Prony, Monge,



## ECONOMY.

Hachette, Hassenfratz, Fourcroy, Vauquelin, Berthollet, Chaptal, Pelletier, Guyton, Morveau, and Merimée. In 1795, the name was changed to E. P.; many alterations were made in the organization; artillery studies were included in the course; and the pupils were ordered to wear a uniform. When Napoleon went to Egypt, 40 pupils from the E. P. accompanied him, many of whom greatly distinguished themselves. Napoleon made the organization of the school more strictly military in 1804, to identify it more fully with the army. The school was dissolved 1816, again 1830, and again 1832, on account of the impetuous way in which the pupils entered into the political disturbances of those years; but as the school suited the military genius of the French nation, it was re-established on each occasion, after the restoration of tranquillity. Candidates can be admitted only on annual competitive examinations. A proclamation from the war office, made public before Apr. 1, informs intending competitors of the subjects on which they are to be examined, and the time when the examinations begin. To be eligible as a candidate, the youth must be French, and must be more than 16, and less than 20 years of age before Jan. 1 following; but soldiers are admissible up to the age of 25, provided they can give proof of two years of service in the regular army. The cost of board alone is 1,000 francs (abt. \$200) a year. A complete course of instruction lasts for two years; when the pupils who have satisfactorily passed the final examinations have the privilege of choosing, from among the various public services supplied from this school, the particular branch which they wish to enter, such as artillery, engineers, the staff, the department of telegraphs, or some of the other government monopolies. The school was reorganized by a decree of 1873, Apr. 15.

**ECONOMY**, n. *ě-kõn'õ-mĭ* [OF. *œconomie* — from L. *œconõmiă*; Gr. *oikõnõmiă*, the management of household affairs—from Gr. *oikos*, a house; *nõmõs*, a law]: the frugal and prudent management of a family or household; frugality; the judicious management and arrangement of the affairs of a nation—the study of the best system for which is called *political economy*; a system of rules or regulations; the operation of nature in regard to animals or plants. **ECONOMIC**, a. *ěk'õ-nõm'ik*, or **EC'ONOM'ICAL**, a. *-ĩ-kāl*, pertaining to household matters; frugal; careful; thrifty. **EC'ONOM'ICALLY**, ad. *-lĭ*. **EC'ONOM'ICS**, n. plu. *-ĩks*, the science of household affairs. **ECONOMIZE**, v. *ě-kõn'õ-mĭz*, to manage money matters, or household expenditure, with frugality. **ECON'OMI'ZING**, imp.: **ADJ.** using with frugality. **ECON'OMIZED**, pp. *-mĭzd*. **ECON'OMIZA'TION**, n. *-mĭ-zā'shŭn*, the act of using to the best purpose. **ECON'OMI'ZER**, n. *-mĭ'zér*, one who. **ECON'OMIST**, n. one who manages household matters frugally. **POLITICAL ECONOMIST**, one who writes on, or teaches, political economy.—**SYN.** of 'economical': parsimonious; saving; sparing; penurious.

**ECONOMY**, *ě-kõn'o-mĭ*: Socialist village of Penn. on

## ECONOMY—ECPHYMA.

the right bank of the Ohio, about 17 m. below Pittsburg. The settlement was planted 1825 by immigrants from Germany. The inhabitants own everything in common—3,500 acres of land, upward of 100 houses, a church, a school, a museum, and manufactories of wool, cotton, and silk. Pop. of community (1895) about 800.

ECONOMY, POLITICAL: see POLITICAL ECONOMY.

ÉCORCHÉ, n. *ā'kōr-shā'* [F. *écorcher*, to flay, to skin—from L. *excorticārē*, to take away the bark; in mid. L. to flay—from L. *corticem*, bark]: in *paint.* and *sculp.*, figure of an animal or human subject, deprived of its skin, so that the muscular system is exposed for the purposes of artistic study. From a portion of the figure the upper muscles also are removed; so as to exhibit those which lie nearer to the bone. It is not uncommon to represent the écorché in action, in the form of the Fighting Gladiator. The first person who did so was Salvage, French artist and anatomist. To render the studies of pupils more complete, Salvage had this figure engraved in all the points of view, and more or less denuded of flesh, till at last it was little more than a skeleton, the only muscles represented being those which immediately cover the bones. Figures of this kind can now be procured both in plaster and papier-maché.

ECOSSAISE, n. *ā-kōs-āz'*: in *mus.*, dance music in the Scotch style.

ECOSTATE, a. *ē-kōs'tāt* [L. *e*, or *ex*, out, without; *costa*, a rib]: in *bot.*, term applied to leaves which have no central rib or costa.

ÉCOUTES, *ā-kōt'* [Fr. *écouter*, to listen]: listening-places, in military operations connected with siege-works. They are small galleries, excavated at regular distances, and going out beneath and beyond the glacis, toward the lines and batteries of the besiegers. Their purpose is to enable the garrison to hear and estimate the works being carried on by the sappers and miners of the enemy.

ECPHASIS, n. *ēk'fā-sis*: an explicit or direct explanation.

ECPHLYSIS, n. *ēk'flī-sis* [Gr. *ekphluzō*, I bubble up]: in *path.*, vesicular eruption, confined in its action to the surface.

ECPHONEMA, n. *ēk'fō-nē'ma* [Gr. a thing called out—from *ek*, out; *phōnē*, the voice, a sound]: in *rhet.*, a breaking out of the voice with some interjectional particle.

ECPHONESIS, n. *ēk'fō-nē'sis* [Gr. pronunciation, exclamation]: in *rhet.*, an animated or passionate exclamation.

ECPHORA, n. *ēk'fō-ra* [Gr. a carrying out, a projection—from *ek*, out; *pherō*, I carry]: in *arch.*, the projection of any member or molding before the face of the member or molding next below it.

ECPHYMA, n. *ēk'fī-ma* [Gr. an eruption of pimples—from *ek*, out; *phuō*, I grow]: a cutaneous excrescence, as a carbuncle and the like.



## ECPHYSESIS—ECSTASY.

**ECPHYSESIS**, n. *ĕk-f'í-sē'sís* [Gr. *ekphusaō*, I breathe out]. in *med.*, rapid breathing.

**ECPYESIS**, n. *ĕk-p'ī-ē'sís* [Gr. *ekpueō*, I bring to supuration]: in *path.*, impetigo; a humid scale.

**ÉCRASEUR**, *ā-krá-zér*: surgical instrument invented by M. Chassaignac, consisting of a fine chain which, passed round any malignant growth, gradually constricts it, and finally crushes its way through it by means of a screw or rack for tightening it, which is worked at the end of the handle. The advantage of this instrument over the knife is, that it causes little or no bleeding, the torn vessels spontaneously contracting and closing. It is specially applicable to cases of cancer of the tongue, piles, polypi, and various kinds of tumors. When a solid mass—as, for example, a considerable portion of the side of the tongue—is to be removed, the chain is sometimes pressed through the centre, and made to cut two lines successively in the form of a V, in which the diseased structure is included. As the pain which is caused by this instrument is very great, the patient should be placed completely under the action of chloroform before it is applied.

**ECRYTHMUS**, n. *ĕk-r'ith'mūs* [Gr. *ekrhuthmos*, out of tune—from *ek*, out; *rhuthmos*, tune]: irregular or disordered beating of the pulse.

**ECSTASY**, n. *ĕk'stā-sī* [OF. *ecstase*—from mid. L. *ecstasis*, a trance—from Gr. *ekstāsis*, change of state—from *ek*, out; *stāsis*, standing, state]: excessive joy; extreme delight; a state of the body in which the functions of the senses are thrown out of their usual condition; a trance. **EC'STASIED**, a. *-sīd*, enraptured; filled with extreme delight. **ECSTAT'IC**, a. *-stāt'ík*, or **ECSTAT'ICAL**, a. *-ī-kāl* [Gr. *ekstātíkos*]: rapturous; transporting; delightful beyond measure; entrancing. **ECSTAT'ICALLY**, ad. *-lī*.—**SYN.** of 'ecstasy': rapture; transport; frenzy; madness; enthusiasm.

**ECSTASY**: state of the mind when dominated by some absorbing (usually delightful) emotion, to such extent as to alter or suspend its functions. The word is applied to those states of mind, which, without amounting to Insanity (q.v.), in respect of the temporary character of the affection, are marked by mental alienation, and altered or diminished consciousness. A person in E. may be violently moved, or completely passive; convulsed, or rigid, or flaccid in all the limbs; silent, or uttering unmeaning or excited language, or assuming the character of a prophet or inspired person; having, or not having intelligence of what is going on around him. The varieties are infinite, because this abnormal state of the mind is nothing more in reality than the fixing of it in a particular attitude, as it were, in connection with an overmastering idea, emotion, or sensation, which causes all other external phenomena to be disregarded. Perhaps the most common, or the best known form, is religious ecstasy, allied to monomania and religious delusion of every kind; often simulated, but also often real, as in the older histories of the conversions of

## ECTASIS—ECTHYMA.

Cambuslang, the *convulsionnaires* of St. Médard, and the epidemics of religious excitement mentioned under Dancing Mania (q.v.). There is an E. of joy, of love, of meditation; also of hate; likewise of terror, in which fear paralyzes the consciousness and the power of motion and expression. E. is developed also in some physical states as catalepsy (q.v.), hysteria (q.v.), mesmerism (q.v.), inasmuch as the proper consciousness of the individual is temporarily abolished, or so much changed in character as to lead almost to the loss of the sense of personal identity. Some of the cases of presumed double consciousness (q.v.) are no doubt of this kind; and generally the same may be said of the state of the mind in many dreams and visions, and in somnambulism (q.v.). A striking picture of this form of E. is the well-known sleep walking scene in *Macbeth*, where the lady's mind is so completely preoccupied with the supposed bloodstain on her hands, that though her eyes are open, we are told that 'their sense is shut,' and the mind is also excluded from all the ordinary avenues of communication.

ECTASIS, n. *ěk'tă-sīs* [Gr. *ektăsis*, extension—from *teinō*, I stretch]: the dilated condition of an artery, as in aneurisms, or of a vein, as in varices; usually applied to the dilatation of small blood-vessels; in *gram.*, the lengthening of a syllable.

ECTHLIPSIS, n. *ěk-thlīp'sīs* [Gr. *ekthlipsis*, a pressing or squeezing out—from *ek*, from; *thlibō*, I press or squeeze]: in *Latin verse*, a rule by which a final *m* with the preceding vowel is cut off, when the next word begins with a vowel.

ECTHYMA, n. *ěk-thī'mă* [Gr. *ekthūma*, an eruption]: pustular disease of the skin, in which pustules often reach the size of a pea, and have a red, slightly elevated, hardish base. In two or three days after the appearance of the pustule, it is replaced by a scab, which adheres firmly to the base, and is somewhat concave. On its removal, a deep red mark, a new scab, an ulcer, or a healed scar remains. The disease may be acute or chronic. The acute form is ushered in by slight constitutional, not amounting to febrile, symptoms, and by a burning or pricking pain at the seat of the eruption, which is usually confined to the neck and shoulders. The disease runs its course in ten days or a fortnight. In chronic E., the pustules which follow in crops (often for several months) are usually scattered over the extremities. This form of eruption indicates a low state of the system. It sometimes follows the acute disease, and not unfrequently is a tertiary symptom of syphilis. Pustules, which in no respect seem to differ from those of E., are produced by various local irritants. Thus the affection of the hands, popularly known as *the grocer's itch*, is produced by the irritation of brown sugar, perhaps by the *acari* often present in it. Stone-masons are said occasionally to suffer from a similar disease. With regard to *treatment*, the acute form would in most cases doubtless disappear in the course of a fortnight, if left en-



## ECTOBLAST—ECTYLOTIC.

tirely to itself; but as the bowels are usually disordered, an occasional alterative aperient, as a few grains of gray powder with a little rhubarb, may be prescribed, and tepid water applied locally gives great relief. The patient should, moreover, be kept on a moderately good, nutritious diet. In the chronic form of the affection, a meat diet and the use of wine or porter are essential; while tonics, such as a combination of bark and nitric acid, are called for. Tepid baths are often useful, and if there is sleeplessness, an opiate may under medical direction be taken at or shortly before bedtime.

**ECTOBLAST**, n. *ěk'to-blăst* [Gr. *ektos*, outside; *blastos*, a sprout, a shoot]: in *biol.*, the membrane composing the walls of a cell, as distinguished from those forming the mesoblast, the entoblast, and the entosthoblast.

**ECTOCARPUS**, n. *ěk-to-kâr'pŭs* [Gr. *ektos*, without, outside; *karpos*, fruit. So called because the theca is not inclosed]: in *bot.*, species of fucoids, typical one of the family *Ectocarpidae*.

**ECTOCYST**, n. *ěk'tō-sĭst* [Gr. *ektos*, outside; *kustis*, a bladder]: in *zool.*, the external investment of the cœnœcium of a polyzoon.

**ECTODERM**, n. *ěk'tō-dĕrm* [Gr. *ektos*, outside; *derma*, skin]: in *zool.*, the external integumentary layer of the cœlenterata, corresponding to the epidermis in man; the outer layer of cells into which the blastoderm is divided after the completion of the segmenting process.

**ECTOPISTES**, n. *ěk-to-pĭs'tēz* [Gr. *ektopizō*, I move from a place]: in *ornith.*, genus of *Columbidae*. *E. migratorius* is the Passenger Pigeon of North America.

**ECTOSARC**, n. *ěk'tō-sârĕ* [Gr. *ektos*, outside; *sarx* or *sarka*, flesh]: in *zool.*, the outer transparent sarcode-layer of certain rhizopods, such as the amœba.

**ECTOZOON**, n. *ěk'tō-zō'ōn*, **ECTOZOA**, n. plu. *ěk'tō-zō'ă* [Gr. *ektos*, outside; *zōōn*, an animal; *zōă*, animals]: parasitic animals which live upon the external parts of other animals, as lice, ticks, etc. Such also are many of the entomostracous crustaceans, parasitic upon fishes. The term E. is in contradistinction to *Entozoa*. It is a question of much importance, not yet satisfactorily answered, if any of these creatures are the causes of diseased states, in connection with which they are sometimes found in particular abundance, or if their presence in unusual numbers is to be ascribed to disease previously existing.

**ECTROPIUM**, n. *ěk-trō'pĭ-ŭm*, or **ECTROPION**, n. *ěk-trō'-pĭ-ōn* [Gr. *ek*, out of; *trōpē*, a turning]: a disease in which the eyelashes are turned outward; it can be remedied by a slight surgical operation.

**ECTROTIC**, *ěk-trōt'ĭk* [from Gr. *ectroma*, abortion]: a term applied to methods of medical treatment which aim at preventing the development of a disease.

**ECTYLOTIC**, a. *ek-tĭ-lōt'ĭk* [Gr. *ektulōtikos*, hardening into a callus; *tulos*, a knot, a callus]: in *med.*, applied to a

## ECTYPE—ECUADOR.

remedy or substance having the power or property of removing callosities or indurations of the skin.

ECTYPE, n. *ĕk'tīp* [L. *ectypus*; Gr. *ektŭpōs*, worked in high relief—from Gr. *ek*, out of; *tŭpōs*, stamp, figure]: a copy from an original; a cast in relief of an ornamental design—sometimes called *Ectypum*. ECTY'PAL, a. -*tī'pāl*, taken from the original; copied. EC'TYPOG'RAPHY, n. -*pŏg'ră-fĭ* [Gr. *grapho*, I write]: a method of etching by which the lines are raised on the plate instead of sunk in: see ETCHING.

ECUADOR, *ĕk-wă-dŏr'* [Spanish term for *Equator*]: independent state of S. America, extending from lat. 1° 40' n. to 5° 50' s.; and from long. 70° to 81° 20' w.; length from n. to s. fully 500 m., and from e. to w. nearly 800; about 120,000 sq. m. It is bounded n. by the United States of Colombia, e. by Brazil, s. by Peru, and w. by the Pacific Ocean. Toward the e. it is drained by the Amazon, which receives all the rivers that flow down the e. slopes of the Andes, while the country w. of the Andes is drained chiefly by the Mira, the Esmerelda, and the Guayaquil—the last more available for navigation than any other stream on the w. coast of S. America. The country is traversed, nearly in a line of a meridian, by the two ranges of the Andes, which, alternating between union and separation, sometimes run into what are called knots, and sometimes inclose, at great elevations, plateaus or table-lands. Among these last, ranging from s. to n., the most important are those of Cuença, Hambato, and Quito—their respective heights above the sea being, 8,640, 8,860, and 9,543 ft. Lofty as these plateaus or table-lands are, they are beset, indeed almost shut out from the world, by pinnacles of occasionally more than equal altitude above their own level. Of these the most remarkable are Chimborazo and Coto-paxi (q.v.). In connection with these physical features, the country is subject to volcanoes and earthquakes—the latter frequently occurring, and the former numbering no fewer than sixteen. The climate comprises every possible variety. Hyperborean cold marks the snow-capped mountains; a temperature at once moderate and uniform renders the upland plains so many paradises; while, on both sides of the dividing ridge, intense heat oppresses the lower valleys. The rainfall is different in different localities. In the basin of the Guayaquil, there is regularly a wet season; between it and Cape San Lorenzo, almost perpetual drought prevails; and in the other direction, the upper tributaries of the Amazon are said to be fed by almost perpetual rains.

The chief cities are Quito, the capital, and Guayaquil, a great commercial emporium; and the towns of the second class, Cuenca, Riobamba, Ambato, and Loja. The government appears to have been constituted on the model of the U. S. of N. America, having a pres. and vice-pres., with a senate and a house of representatives. The foreign trade of E. is carried on chiefly thro' the port of Guayaquil. The imports (1900) were \$6,715,585; exports \$7,709,610. Revenue \$3,812,915; expend. \$3,331,470; principal



## ECUMENIC—ECZEMA.

exports are cocoa, the precious metals, vegetable ivory, cascarilla, caoutchouc, coffee, straw hats, hides, etc. The principal articles of import, in order of value, are cottons, woollens, wines, spirits, groceries, soap and candles, hardware, flour. There were (1902) 90 m. of R. R. and but one wagon road of 115 m. Transportation is chiefly by pack animals, and on navigable rivers by means of 17 steamboats. There were 1,242 m. of telegraph. Pop. est. (1902) 1,205,600, of whom 100,000 were whites, 300,000 mixed race, and the remainder Indians of a mixed race.

ECUMENIC, a. *ěk'ŭ-měn'ík*, or EC'UMEN'ICAL, a. *-ŭ-kāl*, also ŒCUMENIC, ŒCUMENICAL, [mid. L. *œcumen'icus*, universal—from Gr. *oikoumēnikōs*, pertaining to the inhabitable earth, universal—from *oikēō*, I inhabit]: general; universal; a term applied to those ecclesiastical councils regarded as representing the whole Christian Church, or the church of the whole world (*oikoumenē*) (see COUNCIL); and to the orthodox or Catholic Church, regarded as opposed to heretical and merely local sects. The Rom. Catholics claim the designation as appropriate to their own church, which claim the Greek Church and Protestants deny. The term was applied by the Eastern Church, after 587, to patriarchs and archbishops of provinces.

The conditions necessary to constitute an ecumenical or universal or general council are a subject of controversy, which in Rom. Cath. theology assumes importance. A council is said, by Rom. Catholic divines, to be ecumenical in three different ways; viz., in convocation, in celebration, and in acceptation. For the first, the summons of the pope, direct or indirect, is held to be necessary: this summons must be addressed to all the bishops of the entire church. To the second, it is necessary that bishops from all parts of the church should be present, and in sufficient numbers to constitute a really representative assembly: they must be presided over by the pope, or a delegate or delegates of the pope; and they must enjoy liberty of discussion and of speech. For the third, the decrees of the council must be accepted by the pope, and by the body of the bishops throughout the church, at least tacitly. The last of these conditions is absolutely required to entitle the decrees of a council to the character of ecumenical; and even the decrees of provincial or national councils so accepted may acquire all the weight of infallible decisions, in the eyes of Roman Catholics.

ECZEMA, n. *ěk'zē-mă* [Gr. *ekzēsis*, an eruption on the skin—from *ek*, out; *zēō*, I boil]: disease of the skin characterized by an eruption of vesicles which break and discharge a sticky fluid, which dries and forms crusts and scales; usually attended with much itching and more or less swelling and infiltration of the skin. E. is the commonest of all skin diseases, and no period of life is exempt from it. The causes are constitutional and local. Constipation, imperfect digestion, mental anxiety by its effect on the digestive organs, overwork, and abuse of alcohol, are exciting causes. E. is produced often by the applica-

tion of irritating substances to the skin, by excessive sweating, and too frequent washing with a harsh soap. Mechanical irritation, as rubbing and scratching, is an important cause at least of its extension. E. is sometimes complicated with other diseases, such as gout, rheumatism, asthma, catarrh of the stomach, and boils. Occasionally, E. and these diseases appear alternately; at other times they are coincident. This peculiar alternation, though not common, has given rise to a popular superstition that it is unwise to cure an E., as its cure will certainly be followed by some more alarming malady. This is utterly an error; and the physician has to deplore the inefficiency of the curative agents rather than to dread their potency. E. is one of the most obstinate skin diseases, and often resists all treatment. In cases of acute E. the first essential is a thorough evacuation of the bowels; this is best accomplished by a dose of Epsom salts or a glass of one of the natural purgative waters. Locally, nothing stimulating should be used—a simple water dressing is perhaps the most comforting and soothing. During an attack of E., washing the part affected must be abandoned, and in infantile E. the daily bath must cease. Certain articles of food must be avoided, e.g., coffee, sugar, highly seasoned dishes, and pepper. Local treatment consists in protecting the part affected and applying a soothing ointment. A favorite prescription known as Lassar's paste is frequently prescribed; it consists of salicylic acid two parts, starch and zinc oxide 25 parts each, vaseline 50 parts. Medical advice should be had, as it is unwise to prescribe at random for such a hydra-headed malady as E., which, when extreme, becomes dangerous.

EDACIOUS, a. *ĕ-dā'shūs* [L. *edax* or *edūcem*, voracious—from *edo*, I eat]: eating; greedy; voracious. EDA'CIOUSLY, ad. -lī. EDAC'ITY, n. -dās'ī-tī [L. *edūcitas*, voracity]: greediness; rapacity.

EDAM, *ā-dām'*: town in n. Holland, 12 m. n.n.e. of Amsterdam. There is an extensive trade in wood and cheese. The principal industries are shipbuilding, rope-spinning, sawing wood, tanning leather. Pop. (1891) 6,424.

EDAPHODONT, n. *ĕ-dā'fō dōnt* [Gr. *edaphos*, bottom, foundation; *odontos*, tooth]: in *paleon.*, a genus of fishes, family *Chimæridæ*; range, from the Cretaceous rocks to the Eocene.

EDDA, n. *ĕd'dă*, ED'DAS, plu. [Icel. *edda*, great-grand-mother—viz., of Scandinavian poetry]: the two religious or mythologic books of the old Scandinavians—the *Edda Sæmundar hins Froda*, or Edda of Sæmund the Wise; and the *Edda Snorra Sturlusonar*. The former and older of these is a collection of the most ancient mythological and heroic Scandinavian songs, referable probably to different periods between the 8th and 11th c. These songs, supposed to have been collected and arranged by Sæmund Sigfusson, surnamed Frodi, an Icelandic priest (1054–1133), were discovered and first brought to the notice of European scholars in 1643, by Brynjulf Sveinsson, bp. of Skalholt, who applied to them the name of Edda, or 'grandmother.' This



## EDDISH—EDDY.

collection was published entire at Stockholm, 1818, by A. A. Afzelius, after the text of Prof. Rask; and at Copenhagen, 1787-28, with a Latin translation, glossaries, etc. The third vol. of this edition, completed by Prof. Finn Magnussen, consists chiefly of a very learned and copious *Lexicon Mythologicum* by the editor. Complete editions of the text of this Edda were published also by Munch and Möbius, but former editions were superseded by the editions of Prof. Bugge of Copenhagen (1867) and of Grundtvig (1874); still more by the *Corpus Poeticum Boreale* of Vigfusson and Powell (1883). Simrock made a German translation of both Eddas 1851; and both Ettmüller and the brothers Grimm have translated a part of the 'Elder' Edda. The Snorra Edda is a prose composition, and treats of Scandinavian mythology and of the language and modes of composition of the ancient skalds. As the name implies, it is referred to Snorri Sturluson (q.v.), the learned author of the *Heimskringla*, born Iceland 1178, and died by assassination 1241, on his return from Norway where he had lived in the capacity of skald or court-poet. This Edda was published first by P. J. Resen 1665, under the title *Edda Islandorum An. Chr. MCCXV. Conscripta per Snorronem Sturlæ*, etc. A complete edition of the prose E., and the most copious of all, was published at Stockholm by Prof. Rask 1818. The trustees of the Arna-Magnæan legacy in Copenhagen have published an elaborate edition with a Latin translation and notes; and a German edition of both Eddas, with glossary, etc., was published 1859 by Lünig. A complete English translation of the poetical E., by Ben. Thorpe, was published 1866. The younger Edda was translated by Blackwell in his edition of Mallet's *Northern Antiquities* (1847), and by Prof. Andersen of Wisconsin (1880).

**EDDISH**, n. *ed'dish* [a corruption of *eatage*; Fris. *etten*, to pasture]: the pasturage or eatable growth of either grass or corn field; the second crop or aftermath.

**ED'DOES**: see Cocco.

**EDDY**, n. *əd'dĩ* [Icel. *yda*, a whirlpool—from *yda*, to boil: AS. *yth*, a wave, a flood: comp. Gael. *ath*, back; *teich*, to flow]: a current of water or air contrary to the main stream; a circular motion of water; a whirlpool. V. to move, as an eddy. **ED'DYING**, imp. **ED'DIED**, pp. *-did*.

**EDDY, DANIEL CLARKE, D.D.**: 1823, May 1—1896, July 26; b. Salem, Mass. He graduated at New Hampton, Theol. Inst., N. H., 1845, and the following year was ordained pastor of the first Bapt. Church, Lowell, Mass., where he remained 10 years. In 1854 he was elected a member of the Mass. legislature by the 'Know Nothing' party, and was made speaker. After 1856, he occupied pulpits in Boston, Fall River, Philadelphia, and Brooklyn. He made two visits to Europe, travelling through Palestine and Turkey. He is the author of *Young Man's Friend*, (1849); *The Burman Apostle* (1850); *Europa* (1851); *The Percy Family* (1852); *Angel Whispers* (1853); *Heroines of the*

## EDDY—EDDYSTONE.

*Missionary Enterprise* (1854); *City Side* (1854); *Walter's Tour in the East* (1861).

EDDY, HENRY CLARENCE: 1851, June 23———  
———; musician; b. Greenfield, Mass. He had a natural talent for music, which he studied from the time when he was seven years of age, and was an organist at 14. He studied with Dudley Buck, and went to Berlin 1871, where he studied the piano, besides continuing with the organ, under Haupt. He made a concert tour through Europe, playing in the more prominent churches, and in Berlin before the Emperor of Germany. He returned to America, was appointed organist of the First Congl. Church in Chicago, and 1876 became gen. director of the Hershey School of Musical Art in that city. The following year he undertook a series of 100 organ recitals, including the works of all the great masters of ancient and modern organ music. He published much original organ-music and a translation of *Haupt's Theory of Counterpoint and Fugue*.

EDDY, HENRY TURNER, PH.D.: 1844, June 9———  
———; mathematician; b. Stoughton, Mass. He graduated at Yale 1867, and studied engineering in Sheffield scientific school of Yale, where he was instructor in field-work in engineering. In 1868, he was appointed instructor in mathematics and Latin in the Univ. of East Tennessee, at Knoxville; 1869 was made asst. prof. in mathematics in Cornell, where he received the degrees C.E. and PH.D.; was associate prof. in mathematics in Princeton one year, and 1874 was called to the Univ. of Cincinnati, and was appointed dean of the faculty 1874-77 and 1884-5. He studied abroad 1879-80. E. has contributed a number of papers to scientific and technical journals, and has published several books.

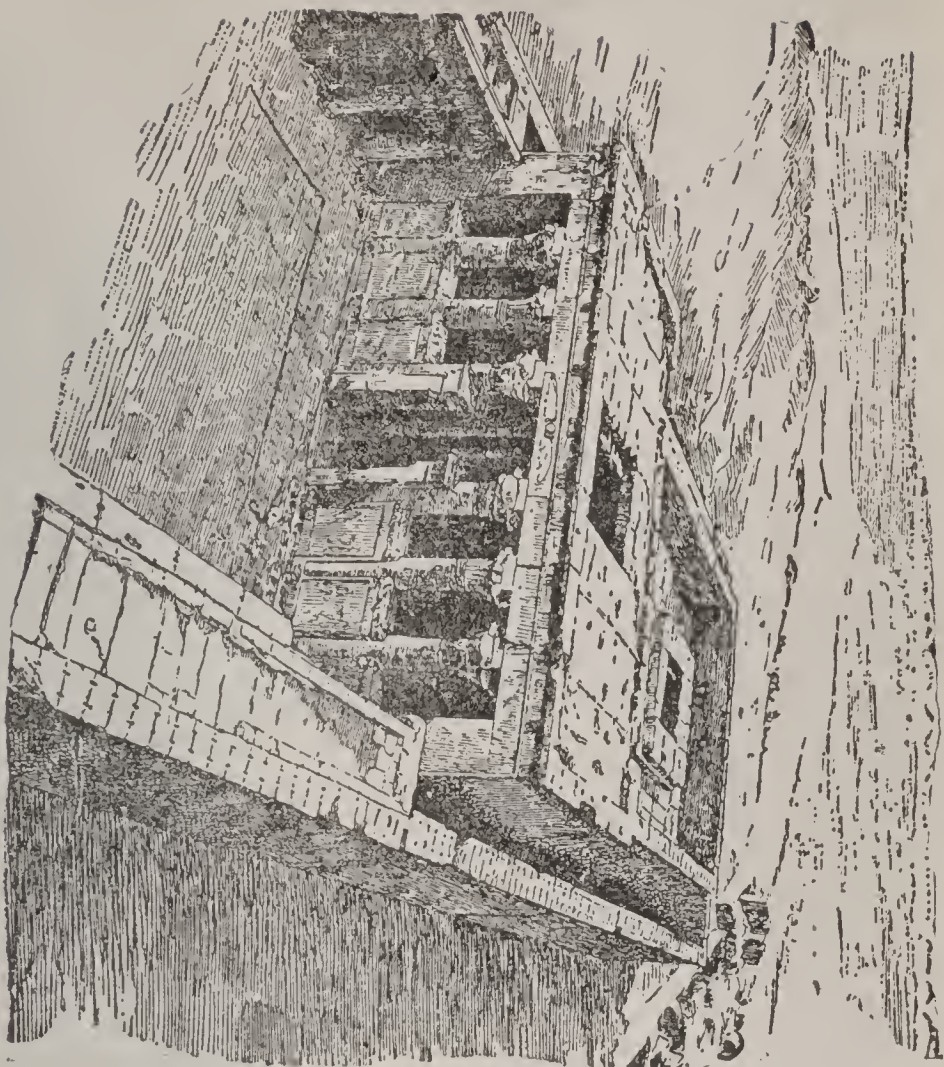
EDDY, MARY BAKER (GLOVER): see SCIENCE, CHRISTIAN.

EDDY, THOMAS: 1758, Sep. 5—1827, Sep. 16; philanthropist; b. Philadelphia. He was poorly educated, and was apprenticed to a tanner when 13 years of age, but went to N. Y., when he became of age, to engage in trade, though he had less than \$100 with which to start. He built up a business; but turned from trade to insurance 1790, in which he was remarkably successful, becoming very wealthy. He was one of the organizers of the Penitentiary system of New York, and one of the founders of the Bloomingdale insane asylum. In 1793 the Soc. of Friends, of which he was a member, sent E. among the Indians, to whom he was of great service. He did much to aid the construction of the Erie canal, and was one of the founders of the New York Savings Bank and the New York Bible Society.

EDDYSTONE, *ed di-stōn*: group of gneiss rocks, daily submerged by the tide, in the English Channel, 9 m. off the Cornish coast, 14 m. s.s.w. of Plymouth Breakwater, lat. 50° 10' 54" n., and long. 4° 15' 53" w. The rocks have 12 to 150 fathoms of water around. The frequent shipwrecks on these rocks led to the erection of a light-house on them by Mr. Winstanley, 1696-1700. It was a wooden



View of the Temple at Edfou, from the top of the pylon.



The Edible Nest of the Salangane of South Java.

polygon, 100 ft. high, with a stone base; but a storm in 1703 completely washed it away, with the architect. Another light-house was built, 1706-09, also of wood, with a stone base, and 92 ft. high, by Mr. Rudyerd, a silk-mercant. This erection was burned 1755. The next, noted for its strength and the engineering skill displayed in it, was constructed by Alfred Smeaton in 1757-59, on the model, it is said, of the trunk of the oak-tree. It was built of blocks, generally one to two tons weight, of Portland oolite, encased in granite. The granite was dove-tailed into the solid rock, and each block into its neighbors. The tower, 85 ft. high, had a diameter of 26½ ft. at the base, and 15 ft. at the top. The light, 72 ft. above the water, was visible 13 miles. As the rock on which this tower was built is worn and greatly weakened, the foundation of another was laid on another part of the reef in 1879. The new light-house, completed 1882, is, like its predecessor, ingeniously dove-tailed throughout. Its dioptric apparatus gives, at an elevation of 133 ft., a light equal to 159,600 candles, and visible in clear weather 17½ miles. On account of the state of the foundation, Smeaton's light-house was taken down as soon as the new one was completed, and removed for re-erection on Plymouth Hoe. See LIGHT HOUSE.

EDELFORSITE, n. *ēd'el-fawr-sīt* [Ger. *edelforsit*—from *Ätelfors*, in Sweden, where it is found]: a transparent mineral of a white or grayish color regarded by some as an impure wollastonite.

EDELINCK, *ēd'el ĩnk* or *ā-dēh-ĭnk*, GERARD. 1627-1707, b. Antwerp. engraver. He was patronized by Louis XIV. and died in Paris.

EDELWEISS, *ā-dēl'vīs* [Eng. noble purity]: *leontopodium alpinum*, lion's-foot: native of high sloping pastures on many parts of the great European mountain-ranges. It is a hardy perennial, growing 4 to 8 in. high, and bearing small, yellowish flowers above a beautiful whorl of oblong leaves which are almost covered with pure white, dense, short down. It is indigenous to the Alpine region, and is plucked by tourists as an evidence of their prowess in mountain-climbing. Within a few years tourists have been forbidden to pick either flowers or leaves, because of the vandalism that was rapidly causing its disappearance from the mountain-sides. Great quantities have been sold by florists in some large European cities.

EDEMA, or ŒDEMA, n. *ē-dē'mă* [Gr. *oidēma*, a swelling]: in *med.*, a minor form of dropsy, consisting of puffiness of a part arising from the effusion or infiltration of serum into cellular or areolar structures. EDEM'ATOUS, a. *-dē'm'ā-tūs*, having edema; dropsical; full of humor. *Ede-ma* has its most frequent but not its only seat in the subcutaneous cellular tissue. It is observed occasionally in the submucous and subserous cellular tissue, and in the cellular tissue of the parenchymatous viscera; and in some of these cases it gives rise to symptoms which admit of easy recognition during life. Thus E. of the glottis (see



## EDEN.

LARYNX) and E. of the lungs constitute well-marked and serious forms of disease; while E. of the brain, though not easily recognized during life, is found in many *post-mortem* examinations of insane patients.

E. may be either passive or active, the former being by far the most frequent. *Passive E.* arises from impeded venous circulation (as from obstruction or obliteration of one or more veins; from varicose veins; from standing continuously for long periods, till the force of the circulation is partly overcome by the physical action of gravitation; from deficiency in the action of the adjacent muscles, which in health materially aids the venous circulation, etc.); from too weak action of the heart (as in dilatation or certain forms of valvular disease of that organ); or from a too watery or otherwise diseased state of the blood (as in chlorosis, scurvy, Bright's disease, etc). Through the knowledge derived from pathological anatomy, the cause can often be inferred from the seat of the swelling; e.g., E. of the face, beginning usually with the eyelids, is commonly caused by obstruction to the circulation through the left side of the heart; or by the diseased state of the blood in Bright's disease; and E. of the lower extremities commonly arises from obstruction in the right side of the heart, unless it can be traced to the pressure of the gravid uterus, or of accumulated fæces in the colon, or to some other local cause.

*Active E.* is associated with an inflammatory action of the cellular tissue, and is most marked in certain forms of erysipelas. It is firmer to the touch, and pressure with the finger produces less pitting than in the passive form.

From the above it will be seen that E. is not a disease, but a symptom, and often a symptom indicating great danger to life. The means of removing it must be directed to the morbid condition or cause of which it is the symptom.

EDEN, *ē'dēn*: river rising in the e. of Westmoreland, in the Pennine Chain, England. It runs n.n.w. through the e. of Westmoreland and Cumberland, past Appleby and Carlisle, and ends a course of 65 m. in a fine estuary at the upper part of the Solway Firth.

EDEN, n. *ē'dēn* [Heb. *eden*, delight]: a place of delight: a paradise, a garden.—*Eden*, according to the Hebrew Scriptures, was the first residence of man. The description in Genesis is brief and obscure. For the allegorical theory, see FALL. In general, notwithstanding features in the narrative plainly figurative, and other features which cause various writers to class it as legendary, scholars still are not lacking who accept the story as a grand outline of facts in an inspired vision fitly cast in pictorial and dramatic form. See COSMOGONY. It is agreed that the locality of E. is unknown. Josephus with other Fathers conceived that E. meant all the region between the Ganges and Nile;

## EDENITE—EDENKOBEN.

Calvin, Huet, Bochart, Wells, etc., have, with slight differences of detail, concluded in favor of Kornah in Babylonia, not far from the Persian Gulf; Reland, Calmet, Hales, Faber, J. Pye Smith, in favor of Armenia, near the sources of the Tigris and Euphrates; Le Clerc, in favor of the region near Damascus; while the modern German school of biblical critics, convinced that the Hebrew account is traditional, and, in its present form, of late composition, and impressed, besides, with the vast antiquity of the far East, have, almost without exception, turned their eyes in that direction, and sought the cradle of the human race in Bactria or Cashmere, or the region n. of it, a part of which is to this day called Audyana, the 'Garden.' An ingenious recent theory is that Eden was in the North Polar region—astronomical arguments being adduced to show that in far ancient ages that was the region of warmth and luxuriance. Mohammedans believe Eden to have been in one of the seven heavens—some say the moon—and that the expulsion from paradise consisted in Adam being cast down upon the earth after the fall. It is useless seeking to identify the river-system of Eden with anything known at present. It is said that there is no river on the face of the globe of which the Euphrates and Tigris (Hiddekel) were anciently separate 'heads' (whether this means 'sources' or 'channels'), as they are said to be, Gen. ii.; for, as Major Rennel has shown, though the Euphrates and Tigris *now* unite for a short space on their way to the Persian Gulf, yet, until the time of Alexander the Great, they kept entirely distinct courses; and therefore it has been assumed that the 'Deluge' completely altered the physical character of the region denoted by the term Eden. This was Luther's notion, to which, however, it has been objected, that the narrative in Genesis is so worded as to convey the idea that the countries and rivers spoken of were still existing in the time of the historian. To this objection the reply might be made that in an antiquity prior to the time of Alexander, the rivers might have had their course similar to the present. More important is the consideration that the science of geology has thrown so much doubt on the literal universality of a Deluge so late as the period assigned to Noah, that it is hazardous to argue on the hypothesis of world-wide changes. For an ingenious argument for the 'lost Atlantis' as the original scene destroyed by a great submergence, see *Atlantis*, by Ignatius Donnelly. The locality of Eden, or of the exact sense in which the Mosaic narrative of it is to be understood, is involved in mystery; and it has become a general opinion, that the spiritual significance of this primeval story is chiefly to be sought—an opinion which derives force from the manner of the New Test. reference to the subject.—See GENESIS.

EDENITE, n. [from *Edenville*, where it occurs]: a variety of aluminous magnesia-lime-iron amphibole, pale in color, and containing less than 5 per cent. of oxide of iron.

EDENKOBEN, *â'dèn-kō-bèn*: town of the Bavarian Palatinate, six. m. n.n.w. of Landau. It is surrounded by



## EDENTATA—EDESSA.

vineyards, which produce much poor wine. There is a bathing establishment at E., also several mills. Pop. (1880) 4,898; (1890) 4,914.

**EDENTA'TA:** order of *Mammalia* established by Cuvier, and generally received by naturalists. Cuvier remarks, that 'although brought together by a purely negative character,' the E. have, nevertheless, 'some positive mutual relations, particularly in the great claws which encompass the ends of their toes, and which more or less approximate to the nature of hoofs; also in a certain slowness or want of agility, obviously arising from the peculiar organization of their limbs.' He included among them, however, the *Monotremata*, which, though so few in number, are now generally separated, on account of the very important differences of organization which characterize them. The remaining E. are divided into two tribes—1. *Tardigrada* (slow-paced), containing only the sloths; and, 2. *Effodentia* (diggers), containing armadillos, pangolins, ant-eaters, etc. The ant-eaters and pangolins are the only E. that are absolutely destitute of teeth; but none of the order have any teeth in the forepart of their jaws, and their teeth are comparatively imperfect in structure, being destitute of enamel and distinct roots. The sloths alone subsist on vegetable food, the rest chiefly on insects or on animal substances in a decaying state. The whole number of existing species of E. is not great; but they appear to have been more numerous and of much greater size in a former geological period, as the remains of the *Mylodon*, *Megatherium*, and *Megalonix* testify.

**EDENTATE**, a. *ē-dĕn'tāt*, or **EDEN'TATED**, a. [*L. edentātus*, rendered toothless—from *e*, without; *dentem*, a tooth]: without teeth; deprived of teeth; without front teeth. **E'DENTA'TA**, n. *-tā tã*, an order of quadrupeds, including the sloths and ant eaters, so called because they agree in being destitute of front or incisor teeth. **EDEN'TULOUS**, a. *tū-lūs*, toothless.

**EDESSA**, *ē-dĕs'sâ* (modern name, *Urfah*, or *Orfa*): very ancient city, on the river Daisan, in the n. of Mesopotamia, 78 m. s.w. of Diarbekir. The Christian or Mohammedan legend, ascribing its foundation to Nimrod, or Khabiba, a female contemporary of Abraham, is unworthy of credence. With the conquest of Persia by the Greeks, the history of E. first becomes clearer. Seleucus, in particular, is said to have done much for the aggrandizement of the city. Christianity was introduced into E. at an early period. In the reign of Trajan, the place was made tributary to Rome, and in 216 became a Roman military colony, under the name of *Colonia Marcia Edessenorum*. During this period, its importance in the history of the Christian Church increased. More than 300 monasteries are said to have been included within its walls; it was the seat of Ephraem Syrus and his school, and had an important part in the Arian and other controversies. With the extension of the religion of Islam, E. fell into the hands of the Arabian caliphs. Christianity declined, and wars at home and abroad during the caliphate,

destroyed likewise its temporal splendor and prosperity, till in 1040 it fell into the possession of the Seljuk Turks. The Byzantine emperors succeeded in recovering E., but the viceroy contrived to make himself independent. He was, however, hard pressed by the Turks, and this rendered it easy for the crusader Baldwin, the brother of Godfrey of Bouillon, to gain possession of the city (1097), and make it cap. of a Latin principality, and the bulwark of the kingdom of Jerusalem. Under the Frankish princes, E. held out valiantly against the Mussulmans, till at length Zengi, ruler of Mosul, succeeded in taking the town and citadel 1144, when all the Christian churches were converted into mosques. An attempt made by the inhabitants to throw off the Turkish yoke, completed the ruin of E.: the Edessenes were defeated by Nur-ed-din; and all not massacred were sold as slaves. After many vicissitudes, in the course of which E. fell successively into the hands of the sultans of Egypt, the Byzantines, the Mongols, Turkomans, and Persians, the city was finally conquered by the Turks, and has ever since formed a portion of the Turkish dominions. At present, E. has numerous mosques and bazaars, manufactures of cotton goods, goldsmiths' wares, and morocco leather, commerce in British manufactures obtained by way of Aleppo, and a large trade in corn, etc., with Syria. E. is regarded by the Easterns as a sacred city, because they believe it to have been the residence of Abraham. Pop. 40,000, of whom 2,000 are Armenian Christians; the rest are Turks, Arabians, Kurds, and Jews.

EDFOU, *ēd'fô* (Coptic, *Atbô*; Egypt. *Hut*; anc. *Apollinopolis Magna*): town of Upper Egypt, on the left bank of the Nile, lat. 25° n., and long. 32° 45' e. It contains the remains of two temples, considered the finest remains of antiquity in Egypt. The larger of these temples was commenced by Ptolemæus Philometor B.C. 181, but does not appear to have been completed till the reign of Claudius. There appears, however, to have been a temple there in the reign of Thothmes III. Its length is about 450 ft., breadth 250. Its entrance is by a gateway 50 ft. high, between two immense truncated pylones, 37 ft. wide at the base, and 114 ft. high. These are adorned with masterly sculptures. Passing through this entrance, the court is reached; it is 161 ft. long, and 140 ft. wide, inclosed by a splendid colonnade of 32 pillars, each differing in design, and surrounded by walls, between which and the pillars there is a stone roof, forming a covered portico. The interior of this court is to a great extent filled up with rubbish, and occupied by wretched dwellings, many of which also are built upon the roof of the temple. Within the temple, there are several chambers, one of which, about 33 ft. by 17, contained the image of the deity; in it was also a zodiac. The effect of the whole is grand and imposing, impressing the mind with the harmony and beauty of the design. An inscription of the outer wall recorded the endowment of the temple by Ptolemy Alexander I., and Darius, Nectanebo, and Nectanebes II. The smaller temple, erected by Physcon and Lathyrus, consists of only



## EDGE—EDGECUMBE.

two chambers. Its walls are covered with hieroglyphics representing the life of *Horus*, the son of *Kneph and Athor*, who were worshipped in the great temple. These temples have been lately entirely cleared by Mariette. E. now has some manufactures of blue cotton cloths, and earthen-ware similar to the ancient Egyptian pottery. Pop. abt. 2,000. —Wilkinson, *Modern Egypt*, p. 274; Brugsch, *Reiseberichte*, p. 225, Lepsius, *Egypt and Ethiopia*, p. 117.

EDGE, n. *ěj* [AS. *ecge*; Icel. *egg*; Dut. *egghe*, an angle, an edge: Ger. *ecke*, a corner: Gr. *úkē*, a point, an edge]: the extreme border of anything; brink; verge; the thin cutting part of a knife, etc.; keenness; sharpness of mind or appetite, in *Britain*, the highest part of a moorish and elevated tract of ground, of considerable extent, generally that which lies between the streams; a kind of ridge. It is used alone and in combination, as in Caverton-edge. V. to sharpen; to furnish with an edge; to border or fringe; to move gradually; in *OE.*, to incite; to provoke. EDG'ING, imp. inciting; moving gradually or sideways: N. a narrow lace; trimming added to a garment for ornament; in *gardening*, an outside row of plants, or a border of stone or wood, or an ornamental wire-work or wicker-work, or sometimes a narrow line of turf. EDGED, pp. and a. *ěđ*, furnished with an edge or border; sharp; keen. EDGE'LESS, a. not sharp; blunt. EDGEWISE, ad. in direction of the edge; sidewise. EDGE-MILL, n. an ore-grinding or oil mill in which the stones travel on their edges. In addition to the crushing action, the edge-mill has a frictional or grinding action. EDGE-PLANE, n. plane for edging boards, having a fence, and a face with the requisite shape, flat, hollow, or round; also a plane for shaving the edges of boot and shoe soles. It has a knife curved to the shape desired, a projecting edge which forms a guide and gauge, and means for adjustment. EDGE-RAIL, n. form of rail for railroads, which bears the rolling stock on its edge. It is distinguished by its name from the flat-rail, which was first used; the angle-rail, which succeeded that, the bridge-rail, which presents an arched tread and has lateral flanged feet; the foot-rail, which has a tread like the edge rail, but, unlike it, has a broad base formed by foot-flanges. Also a rail placed by the side of the main rail at a switch to prevent the train from running off the line when the direction is changed. EDGE-TOOL, a cutting instrument. EDGE-WHEEL, n. a wheel travelling on its edge in a circular or annular bed, as in the ancient Phœnician oil-mills; the Chilian ore-mills, and many other crushing-mills. To SET THE TEETH ON EDGE, to cause a grating or tingling sensation in the teeth. To EDGE IN, to get in; to slide in.

'EDGECUMBE: mountain in what was formerly Russian America, now Alaska, marks the n.w. point at the mouth of Norfolk Sound which lies between the settlement of New Archangel on the island of Sitka and the open ocean. It rises from the water's edge an almost perfect cone, which during nearly the whole year is capped with snow. It has been an active volcano within the recollection of some of

the Russian colonists.

EDHEM PASHA: a Turkish soldier and diplomatist; b. 1823; entered the army and rose to the rank of colonel. He became minister of foreign affairs, with the rank of Muchir; was ambassador at different European courts for eight years; succeeded Midhat Pasha as grand vizier in 1877; and commanded the Turkish forces in the Greco-Turkish war of 1896-97.

EDGEHILL, *ěj'híl*, BATTLE OF: first great battle of the civil war at the period of the English commonwealth; 1642, Oct. 23, Sunday, between the royalist forces under Charles and the parliamentarians under the Earl of Essex. It was the intention of Charles, who had been lying at Shrewsbury, to march upon London by Wolverhampton, Birmingham, and Kenilworth; and Essex, who had thrown himself into Worcester, on being informed of the king's plans, marched forward to intercept him, and entered the village of Keinton, in Warwickshire, on the evening of the 22d. On the following morning, the royalist army was discovered a little in advance, and drawn up in order of battle on the elevation of Edgehill. The king's forces had the advantage in numbers and in cavalry, as well as in position; Essex, however, had the more formidable train of artillery. Charles had commanded that hostilities should be delayed until the enemy should open fire; accordingly no movement took place till about two o'clock, when Essex commenced the fight by firing upon the royalists, who immediately replied with their cannon. The royalists then began to descend the hill, and Prince Rupert, who led the right wing, charged with his cavalry the left wing of the parliamentarians, broke it, and pursued it madly to Keinton, where his men, regardless of the main army, busied themselves in plunder. This was the fatal movement of the day. The right wing of the parliamentarians had charged and recharged with the greatest success, until, after some stubborn fighting around the royal standard, the royalists broke, and retreated toward the hill. That night 4,000 men lay slain at the foot of Edgehill, the greater number royalists.

EDGEWATER, *ěj'waro-tér*: village of Richmond co., Staten Island, N. Y.; in the tps. of Middletown and Southfield; on New York Bay; at Vanderbilt station on the Staten Island railroad, adjoining Stapleton. It contains an acad. and several schools, 9 churches, 1 savings bank, and numerous manufactories, of which those of candles, felt, hats, carriages, paper, and machinery are the most important.

EDGEWORTH, *ěj'wèrth*, MARIA: 1767-1849, May 21; b. Hare Hatch, near Reading, Berkshire, England; daughter of Richard Lovell Edgeworth (1744-1817), of Edgeworthstown, county of Longford, Ireland. In 1782, her father returned to Ireland, accompanied by his family, to whose education he devoted himself. Maria's talents quickly developed. Her first literary effort was written in conjunction with her father, and was entitled *Essays on*



## EDIBLE—EDICT.

*Practical Education* (1798). In 1801 appeared the *Essay on Irish Bulls*, also in part the work of Mr. Edgeworth. But in the sphere of fiction Miss E. won her greatest triumphs. In 1801 she published *Castle Rackrent*, the first of an extensive series of novels characterized in general by a quiet agreeable humor, excellent sense, and lively delineation of character and manners. It has been objected by critics, however, that some of them are too manifestly didactic to please as fiction should please. In 1803 appeared *Belinda*; 1804, *Popular Tales*; 1806, *Leonora*; 1809, *Tales of Fashionable Life*; 1812, a second series of the same. The last of the series was 'Helen,' 1834. Among the most successful of her *Tales of Fashionable Life* were 'Ennui' and 'The Absentee.' Miss E.'s stories for children—the last of which, *Orlandino*, appeared in *Chambers's Library for Young People*—are deserving of high praise. This gifted authoress died at Edgeworthstown.

**EDIBLE**, a. *ēd'ī-bl* [mid. L. *edib'ilis*, eatable; *edib'il'ū*, things that may be used as food—from L. *edo*, I eat]: fit to be eaten as food; eatable. **EDIBILITY**, n. the quality of being edible or eatable; edibleness. **EDIBLENESS**, n. the quality of being edible or fit for food. **ED'IBLES**, n. plu. *-blz*, things fit to be eaten as food.

**ED'IBLE BIRDS' NESTS**, or **EDIBLE SWALLOWS' NESTS**: see **NESTS**, **EDIBLE**.

**EDICT**, n. *ē'dikt* [L. *edictum*, a thing proclaimed—from *e*, out; *dictus*, said, spoken]: the written command or order of a sovereign; a decree; a proclamation having the force of law. The power of making edicts (*jus edicendi*) belonged generally to the higher magistrates at Rome; but was prominently exercised by the curule ædiles, and more extensively still by two prætors—the *prætor urbanus*, and the *prætor peregrinus*. In a province, the jurisdiction of the prætor passed to the *præses*. As this power was co-extensive with the possession of what were called the honors (*honores*), it was frequently spoken of as the *jus honorarium*; and from its being exercised chiefly by the prætors, it was known also as the *jus prætorium*. The edicts of the prætors are mentioned by Gaius among the sources of the Roman law; but, strictly speaking, they are to be considered as rules promulgated by the magistrates on entering on office, rather than as expressions of the will of the Roman people, either direct or indirect. The edict of one prætor was not binding on his successor, but very often edicts were adopted and confirmed, and this came gradually to constitute a very important body of law. They were frequently known by the names of their first promulgators, though they were named often with reference to the formula and the *actio* which they established. The power of promulgating edicts is supposed to have flowed down from the kings to the consuls, and through them to the prætors, and thus to have formed part of what in modern times is termed the royal prerogative. Even in Cicero's time, the study of the edicts had become a regular branch of the study of the law. In B.C. 67, the Lex Cornelia

## EDICTAL CITATION—EDILE.

provided against the abuse of passing edicts for the decision of particular cases by requiring the prætors to decide in conformity with the edicts which they promulgated with reference to their whole tenure of office, which were known as perpetual edicts. Servius Sulpicius, friend of Cicero, addressed to Brutus a work on the subject; and Ofilius made what was probably a compilation of the various edicta, resembling the subsequent one by Julian. The object of the edict, according to the Roman jurists, was to aid, supplement, and correct the civil law, and to render it more conducive to the public service; and they speak of it as 'the living voice of the civil law.' It was, in short, an indirect form of legislation, which public opinion had sanctioned for the public convenience; and there can be no doubt that it contributed what was ultimately the most valuable part of the Roman law. There were many commentators on the edicts under the emperors, among whom Labeo is mentioned and cited by Ulpian (*Dig.* 4, tit. 3, s. 9). Julian is supposed to have collected and arranged the edicts, and given them a systematic form. Gaius, Ulpian, and Paulus composed treatises on the edicts of the curule ædiles; and it is chiefly from the writings of these and the other jurists excerpted in the *Digest*, that we know anything of the character of the edict, the portions of it which have been preserved being mere fragments. They have been collected by Wieling in his *Fragmenta Edicti Perpetui* (Frank. 1733).—SYN. of 'edict': law; decree; ordinance; statute; regulation; manifesto; proclamation; command; order.

EDICTAL CITATION, *ē-dīkt'āl*, or INTIMATION: in Scotch law, citation before a civil court, of a party outside of Scotland. Anciently it was given by a messenger at arms making proclamation at the market-cross of Edinburgh, and at the pier and shore of Leith. Such citation is now, in criminal cases, by delivery of copies at the record office of the keeper of the records of the court of session; abstracts of the copies are ordered to be recorded by the keeper, and to be printed periodically. In other classes of cases, whether the person cited be a party or a witness, citation may be by means of a registered letter by post.

EDICT OF NANTES: see NANTES.

EDIFY, v. *ēd'ī-fī* [F. *édifier*, to build, to instruct—from L. *adificāre*, to build—from *adēs*, a house; *fāciō*, I make—*lit.*, to build]: to instruct and improve the mind. EDIFYING, imp.: ADJ. instructing; improving. EDIFIED, pp. *-fīd*, instructed; improved. EDIFIER, n. *-fī-ēr*, one who. EDIFYINGLY, ad. *lī*. EDIFICA'TION, n. *-fī-kā'shūn*, a building up or improvement of the mind in faith and holiness; instruction; improvement in any kind of knowledge. EDIFICE, n. *-fīs*, a large or splendid building; a large structure. EDIFI'CIAL, a. *-fīsh'āl*, respecting the appearance of an edifice.—SYN. of 'edifice': building; structure; fabric; construction; house; pile.

EDILE: see ÆDILE.



## EDINBURGH.

EDINBURGH, *ěd'en-bŭr-rŭh* or *ěd'en-brŭh*: capital of Scotland, and chief town in the county of Mid-Lothian, occupies a picturesque situation on a cluster of eminences, at a distance of about a mile and a half from the Firth of Forth (q v.), which is here about six miles in breadth. The outskirts extend almost to the shore, and a connection has thus been formed on the north with Leith, the ancient port; Newhaven, a fishing village; and Granton, a modern and rising port. The admirable position of E. has induced the comparison with Athens, from which, as well as its literary fame, it takes the title 'Modern Athens.' The Gaelic name of the city is 'Dunedin.'

The castle, which crowns the highest point in the city, was undoubtedly built first, a town gradually forming on the top and sides of the ridge, which slopes downward to the east. For some centuries the city was confined entirely to this ridge or hill, and was flanked on the n. by a lake or marsh called the Nor' Loch. The remaining merus of defense was a wall built by the citizens about the middle of the 15th c., a few relics of which, of different eras, remain. E. was therefore a fortified town, protected by the castle at its w. extremity. When David I. was induced by his piety and munificence to found the Abbey of Holyrood in the low ground e. of the city, he at the same time empowered the canons of this religious house to found a burgh in a westerly direction toward the city of E., and thus was built the Canongate, afterward united to the city. The beautiful abbey itself has been a ruin since the fall of its roof in 1768. In connection with the abbey sprang up the palace, which became a favorite abode of the Scottish sovereigns. Not, however, till about the era of the murder of James I. at Perth 1437, did E. become the recognized cap. of the kingdom. Neither Perth nor Scone, Stirling nor Dunfermline, being able to offer to royalty security against the designs of the nobles, E. with its castle was thenceforth selected as the only place of safety for the royal household, the parliament, the mint, and the various important government offices. By this means rising in importance, E. became densely peopled, and the houses were built to an unusual height, that the inhabitants might keep within the walls for the sake of protection. The town then consisted of the original main way called the High Street, reaching to the Canongate, and a parallel way, narrow and confined, on the s., called the Cowgate, connected with each other by upward of a hundred narrow cross alleys or closes, between dense clusters of houses. Most of these houses consisted of a succession of floors or flats, each being a separate dwelling, and of such floors there were seldom fewer than six, and sometimes ten or twelve, towering to an immense height, and rendered still more imposing from being built on an eminence.

The citizens remained content with these confined limits till about the middle of the 18th c. Between 1763 and '69, the North Bridge was erected, connecting the old city with the fields on the n., on which the *New Town* was beginning to be built. Shortly afterward, 1788, the line of this bridge

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was extended s. by twenty-two arches (the South Bridge), only one of which is seen where the structure spans the Cowgate, and thus a level way was opened to the southern suburbs, which have since rivalled the new town in rapid growth. George the Fourth's Bridge was erected over the same valley a short distance westward, a considerable time afterward. The Nor' Loch was drained and partially bridged over by the Mound formed from the earth dug from the foundations of the new town, and its situation is occupied by fine public and private gardens which now lie in the centre of modern E., and separate Princes Street, the southmost and most picturesque street of the new town, from the old town. Two other bridges give access to E.—the Regent's Bridge, Waterloo Place, which arches the valley between Princes Street and the Calton Hill to the e.; and at the w. end, the fine Dean Bridge, 106 ft. high over the Water of Leith. The Waverley Bridge, parallel to the North Bridge, connects the Old Town and the New. The area of the city has steadily extended. The new town being built with much regularity in straight streets, and in squares and crescents with numerous gardens, contrasts with the crowded, though picturesque masses of the old town. The dilapidated and dangerous state of part of the old town, and the necessities of sanitary ameliorations in the overcrowded buildings, have occasioned great changes of recent years, and several new streets have been opened through the most crowded and ruinous localities.

Altogether built of durable sandstone from quarries in the neighborhood, the general aspect of the houses is that of great solidity. Among the most interesting features of the town are the Castle, in which are shown the ancient regalia of Scotland; the Parliament House, used by the Scottish parliament before the Union; St. Giles's Cathedral, lately restored, with a magnificent crown on the central tower; the Abbey and Palace of Holyrood (q.v.); the Bank of Scotland, recently rebuilt; the Scott Monument, designed by a native self-taught artist; Heriot's (q.v.) and Donaldson's (q.v.) Hospitals; the General Register House, where all heritable titles and state documents are recorded and preserved; the Post-office; the Royal Institution, where the Royal Soc., and the Soc. of Antiquaries of Scotland, meet; National Gallery; the Univ. and Museum of Science and Art; the Episcopal churches (St. John's and St. Paul's); and the banks, clubs, insurance offices, and hotels of Princes Street and George Street. The unfinished National Monument on the Calton Hill is striking from its position. An Anglican cathedral and a new infirmary have been built. The country round E. is finely varied. From Arthur's Seat and Salisbury Crags, on the s.e., the eye wanders to the Brail Hills on the s., and the richly wooded Corstorphine Hill on the w., all within a mile or two of the town; while further off begin the Pentland Hills, four m. s.e.; and to the north the Firth of Forth, and the Fife coast and hills, form a magnificent background. The climate is bracing and healthful, though the situation is exposed. There



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is less rain than on the w. coast, and high winds are prevalent.

E. is not an important manufacturing town, though it derives considerable commercial importance from its various banks and insurance offices, round which revolves no small portion of the monetary capital of Scotland. The principal industries are brewing (two-thirds of all the ale or beer brewed in Scotland being made in or near E.), printing and publishing with the kindred arts (see BOOK-TRADE), distilling, ironfounding, tanning, and coachbuilding, manufacture of articles in India-rubber, of house furniture, and of jewellery, and the rearing of young trees in nurseries in and around the town, for which the climate is favorable.

E. is the place of residence of considerable numbers of the Scottish landed gentry, and its society is regarded as unusually polished from the predominance of the professional and literary elements in its composition. This arises partly from its being a university town, and partly from the presence of the supreme law courts of Scotland (see COLLEGE OF JUSTICE), all the important legal business being attracted thither on that account; the Edinburgh lawyers have charge of most of the landed estates throughout the n. part of the kingdom, so that there is an unusual number of advocates (barristers), writers to the signet, and solicitors (attorneys and conveyancers) and accountants. Its medical practitioners—surgeons and physicians—have high reputation. E. is much resorted to for the sake of education, for its university (q.v.) and medical schools, its high school, and its various other educational institutes. The Free Church and the United Presbyterian Church have each a well equipped Divinity Hall in E. The Merchant Company's schools (by utilizing certain surplus hospital funds) provide high-class instruction at moderate charges for about 6,000 male and female pupils. There are about 17 well-equipped board schools. The Heriot-Watt College gives scientific training at evening classes for moderate fees. Fettes College, a foundation school, is a handsome edifice.

E. is largely resorted to by visitors, and has an unusual number of hotels. There are three theatres. In the s. environs are fine open links or downs, where the game of Golf (q.v.) has been played from time immemorial; and on the adjoining park called the Meadows, an International Exhibition was held 1886. A suburban railway connects the city with its s. suburbs.

E. is a royal burgh, governed by a town-council composed of 41 members. The town-council elects from its own body a lord provost and six bailies, who constitute the civic magistracy. E. is represented, since 1885, by four members in parliament; till then it returned only two members.

Pop. (1821) 112,235; (1861) 167,851; (1871) 196,979; (1881) parl. 228,357, with suburbs, 236,002. Number of inhabited houses, 42,289: parliamentary and municipal constituency (1882-3), 28,931. Pop. (1901) 316,479.

EDINBURGH, ALFRED ERNEST ALFRED, Duke of: second son of Victoria, Queen of Eng.; b. Windsor Castle,

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1844, Aug. 6. He entered the naval service 1858; declined the Greek throne 1862; became master of the Trinity House, duke of E., earl of Kent, and earl of Ulster, and took his seat in the house of lords 1866; was wounded by an alleged Fenian in New S. Wales 1868; married to the Grand Duchess Marie, daughter of Alexander II. of Russia, 1874; promoted vice-admiral 1882. On attaining his majority he was granted by parliament an income of \$75,000 per annum and on his marriage was given an additional \$50,000. In 1893 he succeeded Duke Ernst as reigning Duke of Saxe-Coburg and Gotha, and resigned his office as admiral of the fleet of the British navy. He died 1900, July 30.

**EDINBURGH, UNIVERSITY OF:** institution of learning, formerly under the govt. of the town-council and officials, to whom, with the ministers of Edinburgh it owed its origin. As early as 1561, the council was moving in the matter. For the purpose of a college they secured, partly by grant, mainly by purchase, the Kirk of Field, a Rom. Cath. collegiate church without the walls of the city, the place where Darnley had been murdered. In 1580, the royal sanction was granted; and 1582, the existing royal charter of the college was issued, giving the magistrates very large powers over the new institution. In 1583, the work of teaching began under a young but distinguished divine, Robert Rollock, first regent and sole teacher. The college was not modelled on the great continental universities, and from the beginning was rather a degree-granting college than a university in the mediæval sense. By 1590 there were four regents, Rollock being principal and prof. of theology. The system of teaching pursued was that each regent carried the men over the whole circle of the sciences taught in four successive sessions; the students who began their course under one regent received no part of their education from any of the others. This inconvenient system was not abolished till 1708, when the regents became professors, each of his special subject. Before this time separate chairs of Hebrew, Mathematics, and Public Law had been created; and three professors of Medicine, soon to become the most celebrated department of university work, were appointed 1685—the professors having at first no salary other than their fees. After the revolution of 1688, the Univ. of E., with its sister universities, was subjected to a parliamentary visitation. Under this supervision, a separate chair of Greek was established; and after 1708, the present arrangement of the Faculty of Arts came into existence. About this period, the Faculty of Law was created; and 1760, the *Senatus Academicus* contained 18 professors besides the principal. After a long struggle between the town-council which sought to retain its anomalous power over the professors, and the university which endeavored to secure some measure of independence in action, an act of parliament was passed 1858, by which the constitution of the univ. was materially changed for the better, and an executive commission appointed to carry out the changes. The government was taken out



## EDINBURGH.

of the hands of the lord provost and council of the city, and placed in the *Senatus Academicus* and a university court; and the patronage of the chairs—from 1582 in possession of the corporation—was transferred to seven curators, three of whom are nominated by the univ. court, and four by the town-council. A general council also was established, consisting (at first partly, now solely) of graduates. The members of council, with the professors and univ. court, vote for the member of parliament for the universities of Edinburgh and St. Andrews. Among the more distinguished of the Edinburgh professors have been M'Laurin, Gregory, the Monros, and Cullen; Black the chemist, Dugald Stewart, Prof. Wilson, Robison, E. Forbes, J. D. Forbes, Thomas Chalmers, and Sir William Hamilton. Carstairs and Robertson were principals. In the list of Edinburgh alumni are the names of Walter Scott and Thomas Carlyle; and Oliver Goldsmith, Charles Darwin, Niebuhr, Lord Palmerston, Earl Russell, and Lord Melbourne studied here.

*Faculties, Degrees.*—The university consists of the Faculties of Arts, Medicine, Theology, and Law. The Faculty of Arts comprises the chairs of Humanity, Greek, Mathematics, Logic and Metaphysics, Moral Philosophy, Natural Philosophy, Rhetoric and Belles Lettres, Universal History, Practical Astronomy, Agriculture, Music, Sanskrit, Engineering, Geology, Political Economy, Fine Arts, Education, and Celtic (instituted 1882). Attendance on the first seven of these is required of candidates for the degree of M.A. The Medical Faculty comprises the chairs of Institutes of Medicine, *Materia Medica*, Medical Jurisprudence, Chemistry, Surgery, Practice of Physic, Anatomy, Pathology, Midwifery, Clinical Medicine, Clinical Surgery, Botany, Natural History. The Faculty of Theology comprises the chairs of Divinity, Ecclesiastical History, Biblical Criticism and Antiquities, Hebrew. The Faculty of Law, comprises the chairs of Civil Law, Public Law, Law of Scotland, Conveyancing. The degrees granted by the univ. are Master of Arts, Bachelor of Medicine, Master of Surgery, Doctor of Medicine, Bachelor of Science, Doctor of Science, Bachelor of Divinity, Doctor of Divinity, Bachelor of Laws, Doctor of Laws.

*Libraries, Museum, Societies.*—The University Library originated in a bequest, 1580, by Clement Little. The bequest amounted to about 300 volumes. The library had the right of receiving every book entered in Stationers' Hall, but a composition of £577 per annum in lieu of the privilege was subsequently accepted. The Univ. Library contains about 150,000 printed vols. and 2,000 vols. of mss. The univ. contains also subsidiary libraries, such as the Theological Library, the Humanity Class Library, etc. The Natural History Museum was established 1812, and received a govt. grant of £200 per annum. It was in 1854 transferred to the new Museum of Science and Art, where it forms a Natural History Dept., of which the prof. of natural history is the *Regius* keeper. The Anatomical Museum was founded by the town-council and the *Senatus*

## EDINBURGH REVIEW.

**Academicus 1826.** The Botanical Museum is in the Botanic Garden, which is in connection with the university. The numerous societies for literary or scientific discussion have an important part in the training of the students. The Speculative Society was founded 1764, and the Royal Medical 1737. The Scots Law, the Dialectic, the Diagnostic, and the Philosophical constitute the Associated Societies of the university. About 100 bursaries or exhibitions are awarded to students; about 80 scholarships, some of them worth over £100 a year; and 10 fellowships, worth from £100 to £160 a year; total value over £15,000.

*Students.*—The number of students has of late been steadily increasing, and in 1893 reached 3,138. Of these 806 were in the arts dept., 79 as students of divinity, 452 of law, and 1,641 in medicine, the most famous faculty. Several years ago, the augmented numbers, especially of the medical classes, required increase of buildings: and a separate med. school was opened 1884 (cost \$1,250,000) of which \$400,000 was supplied by the govt., the rest by private subscription. The lord rector is elected by the undergraduates.

In 1892 the arts and science classes were first opened to women.—See Principal Grant's *Story of the Univ. of E.* (2 vols., 1883).

**EDINBURGH REVIEW:** first of the great critical periodicals which form a distinguishing feature of the literature of the 19th c. It was started 1802, Oct., by a knot of young men living in the northern metropolis, the principal of whom were Francis Jeffrey (q.v.), Sydney Smith (q.v.), F. Horner, and Henry Brougham (q.v.). So much was secrecy believed necessary to the success of the undertaking, that, according to the account which Lord Jeffrey gave to Mr. Robert Chambers, 1846, 'the dark divans' of the reviewers were held for some time 'in a dingy room of Willison's printing-office in Craig's Close,' to which each repaired alone, and 'by back approaches or different lanes.' Of the first number, 750 copies were printed; the demand exceeded this limited supply; 750 more were thrown off, and successive editions followed. In 1808, the circulation had risen to about 9,000, and it is believed to have reached its maximum—from which it has declined—in 1813, when 12,000 or 13,000 copies were printed. The pay of contributors was at first ten guineas a sheet, but shortly after 'the minimum,' says Jeffrey, 'was raised to sixteen guineas, at which it remained during my reign. Two-thirds of the articles were, however, paid much higher, averaging, I should think, from twenty to twenty-five guineas a sheet on the whole number.' The original publisher was the well-known Constable. The political views advocated in the early pages of the *Edinburgh Review* were *whig*, and to these it has consistently adhered to the present day. Its influence in developing and strengthening the political convictions of the whig party cannot be over-estimated; but its power was even more visible, certainly more immediately palpable, in literature. Amid the feeble and effete periodicals of the day, it burst like a bombshell. The keenness

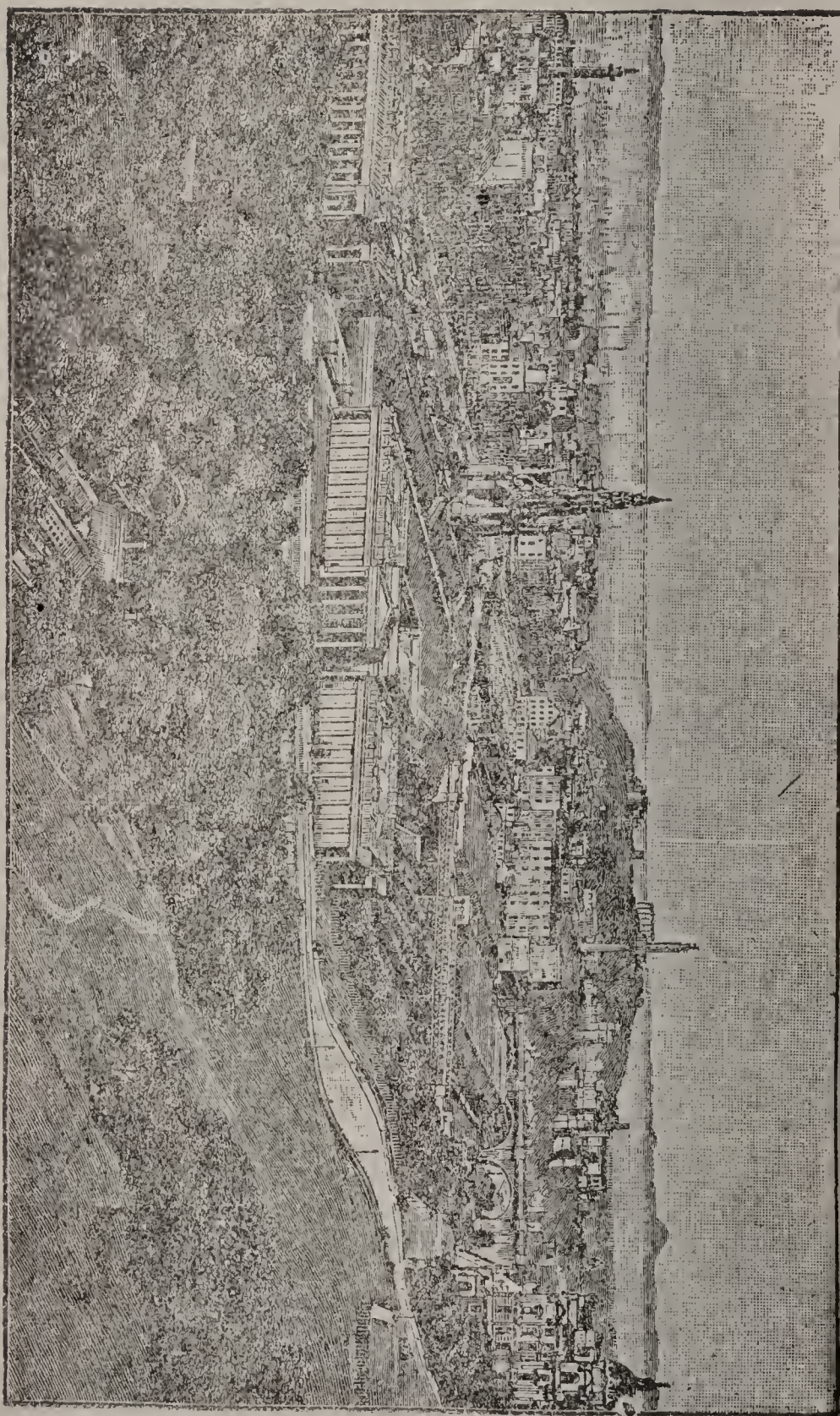


## EDINBURGHSKIRE.

of criticism, the sharpness of wit, the brilliancy of style, the vigor of mind and comprehensiveness of knowledge evinced by the writers, excited amazement and fear in the world of letters; and though, in the case of Wordsworth, Southey, and other writers of a certain school, unfairness of a flagrant kind was undoubtedly exhibited and persevered in, yet impartial justice was, on the whole, administered, and the rising generation of authors strained their utmost to escape the lash. Since the period of Jeffrey, the most brilliant contributor to the *Edinburgh Review* was Lord Macaulay. See *Correspondence of Macvey Napier* (1879). The E. R. is now published in London.

EDINBURGHSKIRE, *éd'en-bür-rüh-shér*, or MID-LO'-THIAN: the metropolitan county of Scotland, on the south side of the Firth of Forth; greatest length from e. to w. 36 m., breadth 18 m.; 367 sq. m. From the s. border, the Pentland Hills (mean height 1,000 ft., highest point 1,839 ft.) and the Moorfot Hills (mean height 800 ft., highest point 2,136 ft.) run n.e. through the county. In the n. are fertile plains, varied by gentle slopes, ridges, and hills of trap. The coast, 13 m. long, is partly sandy, and is studded with towns, villages, and piers. The chief rivers are not more than 20 m. long, and are the Esk, Water of Leith, Almond, and Gala Water. Four great roads and five great railways traverse the county. E. consists chiefly of carboniferous strata, with protrusions of trap. Some lower Silurian rocks occur in the s. east. Coal and iron are worked chiefly in the broad valley of the Esk. Here the bed of coal extends 15 by 8 m., and contains 33 seams  $\frac{2}{4}$  of a foot to 6 ft. thick. The fine sandstone quarries of Craigleith contain large fossil trees, and the limestone of Burdiehouse is famed for fossil fishes. Cold and dry e. winds prevail in spring. Clay-soil predominates. The county is chiefly agricultural, with large farms. The harvest is a week earlier on the coast than at the height of 200 ft., and a fortnight earlier than at the height of 600 ft. Near the metropolis are extensive nurseries, vegetable and fruit gardens, and dairy pastures. In 1881, of the total acreage of 234,926 acres, 134,999 acres were in crop. Although not important as a manufacturing county, there are considerable manufactures of various goods in Edinburgh, Leith, and Musselburgh; and there are large paper mills along the course of the North Esk. Much paraffin oil is made from the rich bituminous shale found within the county. E. returns one member to parliament. It contains 32 parishes. The chief towns are Edinburgh, metropolis of Scotland; Leith, its seaport; Dalkeith, Musselburgh, and Portobello. In E. have been found cairns, stone circles, Roman coins and utensils, and traces of Roman camps and burying places. E. was included in the Roman province Valentia, and Cramond is supposed to have been a chief Roman port. It afterward formed part of the kingdom of Northumbria, 446-1020. The county contains many feudal and ecclesiastical remains, as Borthwick Castle, Craigmillar Castle, and Roslin Chapel. Pop. (1881) 389,164; (1901) 488,796.





View from Edinburgh Castle, looking eastward.



## EDISON.

EDISON, *ed'ĩ-son*, THOMAS ALVA, PH.D.: b Milan, O., 1847, Feb. 11: electrician. He began work as a newspaper boy on the Grand Trunk railroad, between Port Huron and Detroit, and within a few years contracted for the exclusive sale of books and papers on the entire road. His business grew rapidly, and for a time was supplemented by an essay in journalism, the *Grand Trunk Herald*, which he set in type, printed, and sold with his other papers. All the time not required for sleep and his business was applied to reading and study. He became interested especially in chemistry, and conducted experiments on the train till a car was set on fire by some of his phosphorus, when he abandoned chemistry and took up telegraphy. An operator, whose child he had rescued from death on the railroad, gave him his first instruction. As soon as he felt competent to receive and send a message, he sold his railroad contract and sought employment as a telegraph operator. He spent several years travelling through the United States and Canada; and while he soon became widely known as an expert telegrapher, he attained an equally broad reputation as a dreamy, unpractical youth. Acknowledged a 'wizard' before he was 17 years old by 'crack' telegraph operators who could not compete with him, he continued to work when the humor seized him, and to dream and plan. While employed in a southern office as press operator, he experimented with the wires till forbidden to meddle further with them; but in the meantime he had conceived the idea of his first invention, the automatic repeater, by means of which a message could be transferred from one wire to another without the aid of an operator. He next attempted to send two messages over a single wire at the same time, and while so experimenting in Cincinnati was called to Boston and placed in charge of the New York wire, then considered the most difficult of all in the country to manage. In 1871 he removed to New York, and soon afterward invented the printing telegraph for gold and stock quotations. In 1872 he perfected his system of duplex transmission, and established a factory in Newark, N. J., where he manufactured and experimented till 1876, when he built a laboratory at Menlo Park, N. J. In 1886 he bought one of the handsomest residences in Llewellyn Park, Orange, N. J., and erected a cluster of work shops near by. His real career as an inventor began at Menlo Park. In less than 5 years he took out over 100 patents covering not only his discoveries and inventions but every article used in their construction. His inventions include improvements on the telephone, incandescent lamp, phonograph (subsequently greatly improved), quadruplex system of telegraphy, district telegraph system, 'Stockticker,' electric pen and mimeograph, carbon rheostat, pressure relay, hygrometer, odorometer, micro-tasimeter, improved dynamos, the three wire sys. of distrib. the elec. current at a dist. from the generator, the Sims-Edison elec. torpedo and torpedo-boat for naval warfare, the kinetograph and an improved light weight storage battery. It is claimed that he also constructed at Menlo Park, N. J.,

## EDISTO—EDMUND.

the first electric railway (40 miles). Both the originality and priority of several of his most valuable inventions have been contested; but the courts have decided in the main in his favor. He received his degree from Union College; is a chevalier of the French Legion of Honor (1878), and a grand officer of the Crown of Italy (1889); and was awarded the prize medal of the Society of Arts in London, Eng., founded in memory of the Prince Consort as a reward for distinguished scientists (1892).

**EDISTO**, *ĕd'is-tō*: river of S. Car., formed near Branchville by the North and the South Edisto; enters the Atlantic by two channels, between which is Edisto island, abt. 20 m.'s.w. of Charleston. The stream is navigable for 100 m. upward.

**EDIT**, v. *ĕd'it* [F. *éditer*, to publish—from L. *editārē*, the frequentative of *edĕrē*, to publish: L. *editus*, published, uttered—from *e*, out; *dātus*, given]: to revise and prepare for publication; to publish. **ED'ITING**, imp.: N. act of an editor; the making or preparing for the press. **ED'ITED**, pp. **ED'ITOR**, n. *-tēr* [F. *éditeur*]: one who superintends the publication of a book, magazine, or newspaper. **ED'ITO'RIAL**, a. *-tō'rĭ-āl*, pertaining to an editor; written by an editor. **ED'ITORSHIP**, n. the office or position of an editor. **EDITION**, n. *ĕ-dĭsh'ūn* [F.—L.]: the whole copies of a book printed at one time. **EDITION DE LUXE**: see **DE LUXE**.

**EDITIO PRINCEPS**, n. *ĕ-dĭ'shĭ-ō prĭn'sĕps* [L.]: the first or earliest edition of any work; the first printed edition.

**EDMONSTONE ISLAND**, *ĕd'mon-stōn*: an area in the Delta of the Ganges toward the Bay of Bengal; at the mouth of the Hooghly, most westerly arm of the Ganges. It is the arena of a continuous conflict between the fluvial currents and the oceanic tides. From being merely a sand-bank, it came to be covered with shrubs, and even to yield a supply of fresh water. It was adopted under this new phase, as a marine station; but has since been abandoned, because of the encroachments of the sea.

**EDMONTON**, *ĕd'mon-ton*: village in Middlesex, England, 7 m. n.n.e. of London. It is the burial place of Charles Lamb, and is connected with Cowper's poem of *John Gilpin*. Pop. of parish (1881) 23,463; (1891) 25,380.

**EDMUND**, **SAINT (EDMUND RICH, D.D.)**, Archbishop of Canterbury: abt. 1195–1240, Nov. 16; b. Abingdon, England. He studied at the universities of Oxford and Paris, taught in the former several years, introduced the study of Aristotle there, and ultimately applied himself to theology, was ordained priest, and took his degree s.t.d. He was appointed treas. of Salisbury Cathedral 1222, was one of the preachers of the 6th crusade 1227, and resigned the office of treas. and was elected abp. of Canterbury 1233. A week after his consecration, he was instructed by an ecclesiastical council to threaten the king with excommunication if he did not dismiss his foreign councilors as required by a former council. The differences between



## EDMUND IRONSIDE—EDMUND'S HALL.

the king and the abp. were widened when the king secured the appointment of a papal legate, in the hope that his authority might nullify that of the abp. The effort to stem the tide of papal exactions soon proved unavailing, and the abp. retired first to Pontigny and afterward to Soissy, where he died. His tomb became famous for miracles, and the pope canonized him 1246

**EDMUND IRONSIDE**, *ĕd'mŭnd ī'ĕrn-sīd*, King of the Anglo-Saxons: 989-1016, Nov. 30; son of Ethelred II., and half-brother of Edward the Confessor. He is notable chiefly as the great opponent of Canute and the Danish party. On Ethelred's death (1016, Apr.), the Danes proclaimed Canute king of England; but the citizens of London declared for E., who drew together his forces, and engaged Canute, first at Pen-Selwood in Somersetshire, then at Sceorstan (Sherston) in Wilts, and again at Ottenford (Otford) in Kent, in all of which battles he was victorious; but a severe defeat which he sustained at Assandun (Ashdon) in Essex, compelled him to a compromise with his adversaries. An arrangement was entered into by which England was divided between the two kings, Canute obtaining possession of Mercia and Northumbria, the rest falling to the share of Edmund. It was agreed also that on the death of either, the survivor was to succeed him. Soon afterward E. died, and Canute became king of all England. E. received the surname of *Ironsides*, either from his great strength or from the color of his armor.

**EDMUNDS**, *ĕd'mŭndz*, **GEORGE FRANKLIN**: b. Richmond, Vt., 1828, Feb. 1: statesman. He received a public school education, studied law, and was admitted to the bar, and began practicing when 21 years old. He removed to Burlington 1851, was a member of the state legislature 1854-60 and its speaker 3 years, was a member and speaker pro tem. of the state senate 1861-2, and took his seat in the U. S. senate as a republican, succeeding the late Solomon Foot 1866, Apr. 5. He was returned 1869, '75, '81, and '87, and succeeded Vice-Pres. Arthur as pres. (pro tem.) of the senate after the death of Pres. Garfield 1881. During his service he was chairman of the judiciary committee several years in succession; and in 1888-90 was chairman of the judiciary committee, and a member of those on foreign relations and private land claims. He was chairman of the senate committee that acted in conjunction with one of the house in drafting the bill creating the electoral commission of 1877, and was a member of that body; was author of the act to suppress polygamy and disfranchise those who practiced it 1882, declined the appointment of assoc. justice U. S. supreme court 1882, Mar. 11, elected pres. pro tem. of the senate 1883, Mar. 3, and was author of the act regulating the counting of pres. electoral votes 1886. He resigned 1891.

**EDMUND'S (ST.) HALL**: in Oxford University, England, derives its name from St. Edmund, Abp. of Canterbury in the reign of Henry III. As early as 1269, it ap-

## EDOM—EDRIOPHTHALMATA.

pears to have been purchased by the canons of Osney, and devoted to purposes of education. On the dissolution of religious houses under Henry VIII., it fell into the hands of two citizens of Oxford, who sold it to William Denyse, provost of Queen's College. The provost devised it to his college, and that society accordingly now nominates the principal of St. Edmund's Hall. There are ten exhibitions attached to the hall, value £30 per annum, appropriated to students designed for holy orders, and in the gift of the principal. There are usually about 150 names on the books.

EDOM, *ē'dom* (New Testament, IDUMÆ'A): a word signifying 'red'; name given to Esau on account of the red pottage supplied to him by his brother Jacob (see Gen. xxv. 29-34). Hence, the country which Esau afterward obtained was called the land of Edom, but previously Mount Seir. The ruddy hue of the mountain-range, however, may have had something to do with the naming of the region. E. comprised a strip of country 100 m. long by 20 broad, lying between the s. of Palestine and the Gulf of Akabah (an arm of the Red Sea). It is a wild, mountainous region, with the desert on the e. and w. of it; but rugged though it looks, it contains rich glens and terraces, where flowers, and shrubs, and trees spring up luxuriantly. Its cap. was Bozrah (now Buseirah), in the extreme north; its seaports were Elath and Eziongeber, in the extreme south, at the head of the Gulf of Akabah. During the reigns of David and Solomon, E. appears to have been under subjection to the Israelites; but when the kingdom of Israel began to decline, the Edomites repeatedly ravaged the s. borders of Palestine, which perhaps occasioned the terrible denunciation of them by some of the Hebrew prophets. At a later period, the term Edom (now giving way to the Greek form Idumæa) designated the region between the Gulf of Akabah and the Mediterranean, including a part of the s. of Palestine. The revival of Jewish power under the Maccabean princes once more brought Idumæa under Jewish sway. The people were compelled to conform to the laws and customs of their conquerors, and the country was thereafter ruled by Jewish prefects, one of whom, called Antipater, who was born in the country, acquired the friendship of the Roman emperor, and was appointed procurator of all Judæa. His son was the famous Herod the Great, 'king of the Jews.' In the 7th c. after Christ, E. was overrun by the Arabs, and has ever since shared the fortunes of Arabia.

EDRIOPHTHALMATA, n. plu. *ěd'ri-ŏf-thăl'mă-tă* [Gr. *hedraîōs*, settled, fixed; *ophthalmos*, the eye]: section of the class of crustaceans, consisting of those *malacostracous* crustaceans which have the eyes sessile—not mounted upon stalks. They differ from the other malacostraca in having the limbs respiratory. The section was adopted by Owen, and included an order *Lamodipoda*, with rudimentary abdomen; but all are now classed under the order *Tetradecapoda*, with two suborders: *Amphipoda*, in which the organs of respiration are connected with the thoracic limbs, and *Isopoda*,



## EDRISI.

only with the abdominal or false legs. The E. are generally marine; many of the *Amphipoda*, however, are inhabitants of fresh water; some of the *Isopoda*—as the armadillo-louse and wood louse—are terrestrial, but are inhabitants of damp places. Many both of the marine and fresh-water species spend their lives rather among the weeds and decaying matters of the shore than in the water, to consume these being apparently their office in the system of nature; some have organs adapted for leaping and for burrowing in the sand, as the common Sandhopper (*Talitrus locusta*), one of the *Amphipoda*, of which countless myriads are to be seen on sandy shores; some burrow in more solid sub-



Edriophthalma:

1, *Caprella phasma*; 2, *Cyamus Balæniarius* (whale louse).

stances, as the *Limnoria terebrans*, one of the marine *Isopoda*, which sometimes effects the destruction of piers, dock-gates, etc., perforating them in every direction. Many of the E. are parasitic, some of them on whales, some even on prawns and other crustaceans. Some of the parasitic E. are destitute both of eyes and of antennæ.

EDRISI, *ĕd-rê'zê* or *-sê*, ABU ABDALLAH MOHAMMAD BNU ABDALLAH BNU EDRIS, AL-HAMUDI, SHERIF: called also AL-EDRISI, AL-SIKILI (SICILIAN), or AL-RODJARI (ROGER'S): one of the most eminent Arabic geographers, a descendant of the royal family of the Edrisites—who traced their origin to Mohammed himself: b. at Ceuta or Sibta (Civitas), 1099; year of death unknown. He studied at Cordova, and early distinguished himself by the extraordinary range and versatility of his talents. He excelled in nearly all then known branches of science and art; but it was geography which at a very early age seems more than any other science to have attracted him. Having completed his studies, he travelled, visiting Constantinople, Asia Minor, Egypt, Morocco, Andalusia, and the coasts of France and England. Roger II., King of Sicily, invited him, on his return, to his court, and lavished upon him all the honors which it was in his power to bestow. A favorite wish of this monarch—one of the most refined and

liberal-minded men of his age—had long been to have a representation of the earth, founded on the most recent observations. He accordingly invited travellers from all parts of the world to assist him by sending their itineraries, their measurements of longitudes and latitudes, their observations and adventures—in short, all they had seen or heard on their journeys. The collection of this material occupied 15 years, at the end of which it was handed over to Edrisi. Thus guided, he drew up a map, on a globe of pure silver, weighing 450 Roman pounds (50,400 drachmas), in which the whole of the then known world was represented. He, like Ptolemy, divided it into seven climates, beginning at the equinoctial line, and continuing northward to the limits of extreme cold, and intersected each of these with eleven ‘regions,’ represented by perpendicular lines, without any regard to the political or physical features of the respective countries. In explanation of this map, he wrote a book (1153), *Nuzhat al-Moshtak*, etc., in which a full account is given of the towns, mountains, rivers, etc., proceeding from w. to e., according to the order of the climates. Careful as he was in observing and collecting, he could not, in the then state of society and communication, avoid occasional serious blunders; but on the whole his statements are remarkably trustworthy; and being the clearest and most reliable exposition of the state of geographical knowledge in those days, the book remained the great, almost the sole, authority till the time of the Portuguese discoveries. An extract of it was first edited at Rome 1592, in Arabic, entitled *Nubian Geography*, and reprinted in the monastery of Khesruan, in the Lebanon, with Syriac characters, 1597—both editions incorrect in the highest degree. The very title was a mistake, the editors having, by a misinterpretation of a passage, been led to believe that E. was a Nubian. Bernardino Baldi translated this extract into Italian 1600, but his translation was never published. The first published translation was a Latin one, made in Paris (1619) by Gabriel Sionita and Johannes Esronita, a work teeming with the most absurd blunders; and Domenico Macri translated this Latin translation into Italian. Rosario Gregorio’s Latin version of the portion referring to Sicily was published with the text in a collection of Tardia 1790. Portions of the Arabic text, with comments, have been separately published; the chapters relating to Africa and to Spain by Hartmann (Göttingen 1796); those concerning Syria by Rosenmüller (1828); and those on Africa and Spain again by Dozy and Goeje (Leyden 1866).

The translation of E.’s whole work, in French, was made from two mss. in the Imperial Library, by Jaubert, and published (Paris 1830 and 40), but it is unfortunately not sufficiently faithful. The full text has never been edited.

The incidents of E.’s life have given rise to interminable discussions. The year and place of his death, as also his creed, whether Mohammedan or Christian, remain vexed questions. Chief authorities regarding E. are Hadji Kalifah, Schnurrer, De Sacy. Slane, Quatremère, Reinaud, Amari, etc.



## EDUCATE—EDUCATION.

**EDUCATE**, v. *ĕd'ū-kāt* [L. *edūcātus*, brought up, reared—from *e*, out of; *dūcō*, I lead: It. *educare*]: to bring up; to instruct; to inform and expand the mind; to bring up, as a child. **ED'UCATING**, imp. **ED'UCATED**, pp.: **ADJ.** instructed; trained; furnished with knowledge. **ED'UCATOR**, n. *-kā-tēr*, an instructor; a teacher. **ED'UCA'TION**, n. *-shŭn*, instruction; formation of manners; the cultivation of the moral, intellectual, and physical powers. **ED'UCA'TIONAL**, a. *-āl*, pertaining to education. **ED'UCA'TIONIST**, n. *-shŭn-ist*, one who makes the science of education a special study. **SYN.** of 'educate': to train; teach; inform, breed; mature; rear; discipline; indoctrinate; enlighten.

**EDUCA'TION**: art of drawing out or developing the faculties—of training human beings for the functions for which their nature is fitted. Now, in order to the perfection of an art, it must be founded on a corresponding science; and of nothing is this more true than of education. Before we can hope to mould a human being in a desired way, the nature of that being must be well known. The knowledge of man's nature is usually comprehended under three divisions: the constitution of his body (physiology); the constitution of his mind (psychology); his moral and religious or spiritual nature (ethics and religion). If we suppose these branches of knowledge thoroughly investigated, they would furnish the solution of the two main points on which all questions of education turn: first—What are the dispositions and acquirements which it is most desirable to implant and foster? in other words, What is the end or aim that the educator ought to pursue? and secondly—What are the best means to attain that end? But the sciences above named are themselves in too imperfect and unsettled a state to be the basis of any theoretical plan that would be generally accepted; for our knowledge of living beings, and still more of moral beings, must, as is now acknowledged, be the last to acquire the form of science: see **SCIENCE**. It is needless, therefore, to look as yet for any complete theory or *philosophy of education*. Education has existed as an art from the very infancy of society, but it is as yet mostly an empirical art, the rules and methods of which have been arrived at by the blind groping of experience—by the process of trial and elimination of errors. The art of education is still in the condition in which the art of agriculture was until the present century, when, by the aid of chemistry and vegetable physiology, then greatly advanced, a scientific foundation was laid for it by Liebig and others. Even were the sciences of physiology, psychology, and ethics, on a more satisfactory footing, they would not be immediately serviceable as a foundation for a theory of education, without a preliminary step. This would consist in deducing from them an intermediate science, embodying the *laws of the formation of character*. According to J. S. Mill, it is a body of doctrine of this nature, to which he proposes to give the name of ethology [Gr. *ethos*, habit, custom], that would properly be 'the science of which education is the art.' But so far is such a science from being yet constructed,

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that it is only lately that the necessity for it has been pointed out. Notwithstanding this lack of scientific foundation, the practical art of education has, in recent times, undergone great improvement in almost all its details. It is chiefly in discussions on the subject that the want of fixed scientific principles makes itself felt. A debate on any topic connected with education usually presents little but a hopeless chaos of conflicting opinions, the most inconsistent arguments being often urged in favor of the same view. What renders the confusion greater is the fact that education is a subject on which every one thinks himself capable of pronouncing an opinion. But this is only another indication of the want of fixed scientific principles. No one presumes to meddle with a question of astronomy or of chemistry unless he has made it the study of a life. In like manner, it is to be hoped that, in proportion as we advance to a philosophy of education, there will be fewer who will take upon themselves to settle off-hand the most difficult questions regarding it.

Below are noted the chief divisions into which the subject of education naturally falls, together with the leading questions that give rise to differences of opinion.

*Definition.*—It is necessary at the outset to limit the application of the term education. In the widest sense of the word, a man is educated, either for good or evil, by everything that he experiences from his cradle to his grave. But in the more limited and usual sense, the term education is confined to the efforts made, of set purpose, to train men in a particular way—the efforts of the grown up part of a community to inform the intellect and mould the character of the young; and more especially to the labors of professional educators, or schoolmasters. It is evident, however, that school education cannot be understood or practiced rightly except by those who have mastered the idea of education in its widest sense. It is only the educator who can appreciate the influences that have gone before his own, that are running parallel with them, and that will come after them, who is in a position to judge of the course to be pursued.

*Moral Training.*—The means employed in education fall naturally under two heads: discipline, or moral training; and instruction, or the imparting of information; though the two often run into each other. Under the head of discipline, come the forming of habits of order, self-control, obedience, civility, love of truth, and reverence for what is good and great. All but the mere outward forms of these is beyond the power of direct teaching; they are imbibed through the silent influence of example. The child instinctively respects and reverences what it sees others respect and reverence; above all, the unselfish affections are called forth only by the breath of affection from without. In this part of the process, it is evident that the school and the professional educator only take part with other influences. Nor do they even play the chief part; the home and neighborhood are here the predominant educators.—For some considerations on the vexed question of the teaching of re-



## EDUCATION.

ligion in schools, and on the question between voluntary and state schools, see EDUCATION, NATIONAL OR STATE.

As the process of moral development, through the general surrounding influences, is for the most part unconscious on the part both of those who act and of those who are acted upon, it has not yet secured the attention that it deserves; in fact, the other branch of the subject, viz., instruction, or intellectual education, being more particularly the business of the schoolmaster, has come in common language to usurp the whole field, so that, by education, we seldom mean more than this subordinate department of it, the imparting of information—instruction.

*Instruction.*—The business of instruction involves two main considerations.—1. What to teach? 2. How to teach it?

1. Of the vast mass of truths composing the sum of human knowledge, which are to be selected as the *encyclopædia* or curriculum of study for youth? In determining this question, it is to be born in mind that every truth learned serves two uses—as knowledge to be acted upon, and as mental discipline. In selecting, then, what to teach, we have to consider, not only what is in itself most useful, but also what has the greatest degree of improving effect. On this point, we agree with a recent writer, that ‘we may be quite sure that the acquirement of those classes of facts which are most useful for regulating the conduct, involves a mental exercise best fitted for strengthening the faculties.’ This has been made the basis for an objection to the prominence given to the teaching of the dead languages of Greece and Rome, in modern education generally. While it is not disputed that a course of the classics, well taught and well learned, is a good intellectual discipline, it is argued that so is any kind of knowledge, well taught and well learned, a good intellectual discipline—better than more valuable knowledge imperfectly taught and learned. The question is, whether an equally good culture of the faculties would not be got from a systematic course of equal duration of English and other modern languages, together with logic and moral and physical science. In this case, the subject-matter of the teaching would be an acquisition of great value in after-life to every one, which cannot be said of the other. In the learned professions, no doubt, and for those following literary pursuits, a knowledge of Greek and Latin is of direct use, and will doubtless continue an indispensable element of education; but perhaps three-fourths of those who receive what is called a ‘liberal’ education, and therefore devote the strength of six or seven years to Greek and Latin, cease all attention to these languages from the time when they leave school. While it cannot be maintained that the same effects in the way of discipline have as yet been actually produced, on any great scale at least, by the teaching of science and of modern languages, as result from the drill of the classical schools, it is urged that this arises from the fact, that no such course of instruction has hitherto been pursued with the same system and perseverance which characterize classical schools,

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This interesting and important question must still be held open to debate, with the prospect not that the ancient classics will be degraded from their rank, but that their hitherto almost exclusive prerogative may be in noticeable degree shared with other studies.

In respect of direct utility, the things most necessary to know, are those that bear most directly—

1. On the preservation of life and health, and the proper performance of the more common industrial labors. This involves a knowledge of our own bodies and of the bodies of which the universe is made up; in other words, more or less of the knowledge which, when put into systematic forms, is known as the sciences of physiology, natural philosophy, and the other physical sciences.

2. A knowledge of our moral relations. Besides a knowledge of the ordinary moral duties, and the high religious sanctions with which they are enforced, this implies some acquaintance with the laws of economy.

3. As a preliminary step, and as the medium through which all other knowledge is conveyed, there is required a knowledge of the mother-tongue, and the faculty of reading and writing it. Allied to language is a knowledge of counting and measuring, and the naming and classifying of the objects of which the world is composed (natural history), together with a knowledge of the countries and places on the earth's surface (geography).

4. The cultivation of the taste and the imagination, or the faculties which derive pleasure from music, painting, sculpture, architecture, poetry, and works of fiction.

For a complete tabular view of the various branches of human knowledge or sciences, together with the corresponding arts or applications, see SCIENCE: see the same title also for the natural order of dependency among the fundamental sciences, which determines the order in which the different kinds of facts should be taken up. See besides the books named below, Bain's *Education as a Science* (1879); Browning's *History of Educational Theories* (1881); and Fitch's *Lectures on Teaching* (1881).

The different offices and employments characteristic of an advanced state of society, require a corresponding difference in the amount of knowledge and skill possessed by those who are to fill them—a difference which is vaguely and inadequately expressed in the usual division of schools into primary schools, middle or higher schools, and universities.

A course of primary instruction embraces only what is considered absolutely indispensable. Not that there is a limit to the degree of intelligence that is desirable in any class of the community; but for those who must, from early years, spend most of their time in manual labor, i.e., for the vast majority of the race, there is a very short limit to the degree possible. The grand question here would be to determine the order of desirableness of the different subjects to be taught, so that, beginning with the most indispensable, more and more might be added as circumstances would permit. Until recently, reading, writing, and arithmetic



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were considered the beginning and end of a course of primary instruction. These however, are not so much knowledge themselves as instruments for acquiring knowledge; therefore the primary teacher in the present day considers it his duty to give, in addition, as much information of a directly useful kind as possible. But in avoiding one error, he not unfrequently falls into the opposite; for, after all, the three branches above named are the first and most indispensable steps in instruction. Those who can read and write may acquire information after leaving school. Reading and writing, unless learned at school, are, as a rule, never learned; and thus the grand access to knowledge remains for ever shut. Nor is it enough to have made a beginning in the arts of reading, writing, and counting; unless such a degree of facility is acquired before leaving school as to render the exercise a pleasure, it is not kept up in after-life, and the little that was learned is soon forgotten. We believe that in all schools, but especially where the children are liable to be early withdrawn, everything else ought to be held secondary until the painful stage in learning to read, write, and count is fairly passed. With regard to the positive knowledge hitherto got in primary schools, there is a general feeling that few teachers succeed in giving it a direct bearing on the actual concerns of life. Hence the aversion expressed in many quarters to the introduction of the 'ologies' into common schools, and the rather vague demand for the teaching of 'common things.'

Middle or secondary schools serve either for those who have leisure for a higher degree of culture than the elementary course above described, or they serve as nurseries for the highest kind of educational institutions, viz., the universities. Under the head of secondary schools may be ranged the institutions that go by the names of high schools, academies, grammar-schools (the *gymnasiums* of Germany, and the *colleges* of France, and many of the colleges of the United States—see COLLEGE). In these, the course of instruction usually embraces other languages besides the mother-tongue, and more or less of the elements of the various sciences. The titles of any good and complete series of text-books give a notion of the great variety of subjects considered requisite in middle-grade education. Much remains to be done to outline a judicious course of middle-grade instruction—sufficiently wide to be a foundation for after-acquisitions, yet not so multifarious and detailed as to be impossible to overtake except as ill-digested 'cram.'—Where preparation for the university is the object, Greek and Latin are the chief subjects of attention.

The highest degree of culture is represented by the university (q. v.).

*Special or Technical Education.*—Up to a certain point, the education of all young persons is, or ought to be, substantially the same; for the end in all cases is to train them up to be intelligent, virtuous, and active men and women, capable of turning their talents to account in whatever situation they may be placed. But in all civilized societies, the duties and employments are so diverse, that the members

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must begin betimes to receive special training, according to to their future destination. This special training is either of an intellectual or a mechanical kind, or it may partake of both. This branching off of education into special tracks is conspicuous in the higher education in universities, where from the very first there have been—besides the faculty, as it is called, of philosophy, including a number of branches of a general nature—special departments or faculties of law, medicine, and theology. But besides these ‘professions,’ as they are styled, a number of branches of industry have in recent times, by the application of scientific processes, and from other causes, risen into a condition which requires, at least for those who are to direct them, a special range of instruction and information: such are engineering, mining, agriculture, chemistry applied to the arts (technology), for which special schools are now established in most centres of industry. There are two ‘specialties’ which, from the immense numbers engaged in them, assume unwonted importance—namely, agriculture (see AGRICULTURAL SCHOOLS), and commerce. So prominent a place does commerce hold in Britain and America, that a school above an elementary school, and at the same time not a classical school, frequently gets the name of commercial. The chief points in a special education for the mercantile life are usually held to be, facility in writing and calculating, and a knowledge of book-keeping. What might seem the most essential part of a mercantile education, is usually neglected—the principles, namely, of political economy—the science of wealth: this may be due to the public uncertainty arising from the warring systems and the still unsettled principles which that science presents.

*Industrial Education.*—The acquiring of mechanical skill for a particular handicraft or occupation—in other words, apprenticeship—is properly a part of education; but as it is not usually begun until the school education is considered finished, it hardly falls within the province of the present discussion. Yet the abrupt separation of these two stages is attended with evils that are beginning to make themselves felt. For, first, the poorer classes, either from necessity or cupidity, are induced to withdraw their children from school as soon as the provisions of the laws dealing with education will permit them, so that they may as early as possible turn the capabilities of their children to practical account. When to this is added the irregular attendance even during the few years that pupils are nominally at school—and this is a difficulty which neither British nor American laws have yet been able wholly to subdue—the result is, that this class remain to a great extent uneducated; comparatively few have surmounted the initial mechanical difficulties of reading and writing, so as to keep up the habit in after-life, and thus they soon lose the little acquirements they had made.

On the other hand, to continue the intellectual and moral education of youth up to the age of 14 or 16, as is the common practice among those who can afford it, and then abruptly to break this off, and begin at once an industrial



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occupation on the full time of an adult who has been used to the work, is, on the face of it, an irrational proceeding. The power of applying steadily, day after day, to one occupation, is the hardest lesson for man to learn; it is that which, more perhaps than anything else, distinguishes civilized man from savage and semi-barbarous man; and as the boy is 'the barbarian of the civilized community,' this aversion to steady industry is yet strong in him. It is surely wise, then, to break him into it gradually; to begin, while yet his school education is going on, by short exercises of his industrial faculties at first, and gradually to increase the daily hours of work as his physical strength and powers of will become hardened. We believe that many a youth who, on the usual system, breaks down at the very commencement of his industrial career, runs away from his apprenticeship, and becomes unsteady, idle, perhaps a *scamp*, for life, might, by a gradual initiation, have become an industrious man and good member of society. So far, again, would this plan be from infringing upon the usual education given at school, that it is only in some such way that, in a country like ours, the school education of those who have to earn their own bread can be prolonged to the age necessary for learning much that every member of the community should know.

Theoretically, we believe it to be indisputable, that school education and industrial training ought to be conjoined. How to make them dovetail into one another in practice, is the difficulty. One step toward it was made in Britain in the compulsory *half-time system* for factory children. (For the provisions under the Education Act and the Factory Act of 1878, see FACTORY ACTS.) Children may be employed as early as the age of 10 years, but all between the ages of 10 and 13 (or 14 if the child have not a certificate of educational proficiency) are limited to half-time daily either forenoon or afternoon, or to whole-time every alternate day; nor can they be employed even in these ways but on condition of receiving three hours' schooling daily, or the usual school hours every alternate day. Experience has established the fact, that in proportion to the hours spent in school, these 'half-timers' make more rapid progress than the whole-day scholars; at the same time, whether they are destined to be factory-workers for life or not, they are acquiring habits of industry and manual dexterity which are of essential use in any future employment.

Industrial training is now conjoined, to a greater or less extent, with school-teaching in almost all institutions for the education of pauper children—parochial schools, ragged schools, as well as in professedly industrial schools: see INDUSTRIAL SCHOOLS: RAGGED SCHOOLS: REFORMATORIES. The chief difficulty in this movement is to find fitting work. And here it may be observed, that the object is not to teach particular trades with a view to the boys following these in after life; this, though desirable, would obviously be impracticable as a general system. The object is, to

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promote the health, to develop the muscles, and to induce habits of steady and patient endurance of work.

The industrial training of girls is of yet more urgent necessity than that of boys. The ordinary domestic operations involved in household management ought naturally to be learned at home under the guidance and example of the mother; and the object at school, in a right and normal state of things, would be to initiate the girls in things, in the way of improvements, that their several homes might not exhibit—to insure progress, in short. But unhappily, in the homes of the great mass of the operative population, the mother is unfit or poorly fitted for this primary duty. The extension of the factory system of work, instead of the domestic, has revolutionized the domestic life of a great part of the operative population, and too much of a *laissez-faire* policy in education has allowed a generation to spring up, in which a great part of the married women have lost whatever traditional housewifery their mothers might have had, and can neither cook, wash, nor sew. The consequence is, that the food of the household is unsavory, indigestible, innutritious, and at the same time unthrifty; while the whole *ménage* has that character of untidiness and discomfort that often drives the husband to the grog shop. For girls of this class, there is needed a training in some public institution in the very elements of housewifery; while, for all classes, there is great need for instruction in a better style of cookery than that generally prevalent. In Great Britain, the public mind has at last become awake to this necessity, and domestic economy has been made an essential element in primary schools for girls. In the United States greatly increased attention is being given to this department of schooling.

2. 'How to teach it.'—It is a great error to suppose, that because a man knows a thing, he can therefore teach it. Teaching is one of the most difficult arts, and requires natural aptitude and acquired skill. The necessity of special study and practical training or apprenticeship to make a schoolmaster, is a discovery of recent date, and has given rise to teachers' seminaries or Normal Schools (q.v.), where they receive special instruction in the most approved methods of teaching, and practice in their application. It is to the greater acquaintance with right methods, on the part of schoolmasters, that we are to look for the solution of one of the greatest difficulties—how, namely, to overtake all the work that is necessary to be done in the school-period of life, without keeping the learners too many hours a day at their tasks. As things have usually been managed, very little of the time devoted to lessons has been spent in actually learning anything whatever; as any one may satisfy himself by calling to mind how his own time was spent while seated on the school-benches. The modern improvement in this respect, though gratifying, is far from general. There is here a rich mine waiting to be worked—the gold-fields of future generations. It is not to be disputed, that three hours of hearty, spirited exertion will do more, in the



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way of learning, than is accomplished in six hours in most schools.

Illustrations have been published lately, showing the real illiteracy that is often the outcome of our educational methods, and the illustrations extend to those even who have gone through all preparatory schools, and are members or graduates of colleges. As late as two generations ago, pupils were kept steadily on the important work of spelling, writing, arithmetic, and a simple grammar; and, even with a few winters' schooling, became accomplished comparatively in these main branches. But the newer time has attempted to cram its diversified knowledges and arts into the schools; petty exercises have been multiplied; numerous and inflexible grades (14, requiring 7 years in primary and grammar courses in New York, and many, requiring 9 years of the same in a typical Mass. town) have been instituted; booksellers and authors have been accessory in furnishing long series of increasingly elaborate text-books; and teachers' conventions have their very life in novel notions. The public school needs to return to simple essentials.

See INFANT SCHOOLS: EVENING SCHOOLS: MONITORIAL SYSTEM: PESTALOZZI: HAMILTONIAN SYSTEM: KINDERGARTEN: EDUCATION, NATIONAL OR STATE: SCHOOLS, PUBLIC AND GRAMMAR, in England: ENDOWED SCHOOLS ACTS, in England: REFORM SCHOOLS: RAGGED SCHOOLS: INDUSTRIAL SCHOOLS, and INSTITUTIONS: EDUCATION, MILITARY: COLLEGE: UNIVERSITY: also OXFORD, UNIVERSITY OF: CAMBRIDGE, UNIVERSITY OF: ETC.: also HARVARD UNIVERSITY: YALE UNIVERSITY: ETC.: see also such works as *Aristotle and Ancient Educational Ideals* by Thomas Davidson; Rosseau's *Émile*; Pestalozzi's *Leonard and Gertrude*; Herbert Spencer's *Education: Intellectual, Moral, and Physical*; *On Self Culture* by John Stuart Blackie; *European Schools* by L. R. Klemm; *Education in the United States* by R. G. Boone; *Mental Development of the Child* by W. Preyer; *Apperception, a Monograph of Psychology and Pedagogy* by Karl Lange; *Lectures on Teaching* by J. G. Fitch; *School Management* by Emerson E. White; *Schools and Studies* by B. A. Hinsdale.

EDUCATION, MILITARY: see MILITARY SCHOOLS: UNITED STATES MILITARY ACADEMY. For education of officers for the navy, see UNITED STATES NAVAL ACADEMY.

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EDUCATION, NATIONAL OR STATE: provision made by various states for the education of their citizens (see EDUCATION). By 'National Education' is understood (1) the means taken by the body of any nation, either through the state or other organizations, for educating the people; (2) the objects which the nation ought to place before itself in its educational measures. Among ancient nations, and among not a few nations now existing, education in any definite sense did not, and does not, exist for the masses of the people. The children grow up in reflective or unreflective imitation of their fathers. But at all times, nations which have quite emerged from the savage state, have had some more or less organized scheme of education for the leisured and governing classes. The purpose kept in view in such education has been to fit the pupils to discharge certain duties of war or government. In addition to this, the priesthood had the education which their traditional doctrines, hymns, laws, and customs afforded. That man as such, apart from any special practical ends, should be educated, was an idea late of being recognized, and occurred first to the Greeks. But neither among them nor their imitators, the Romans, was the education of *the masses of the people* ever contemplated. Education, properly so called, was confined to a few. In the centuries which succeeded the introduction of Christianity, the church was the great educating body—training those intended for the service of the altar, not only in Christian doctrine, but in all the learning of the past. This, at least, was the general tendency of education in the church. But it was not till the Reformation in the 16th c. that learning, even to the limited extent of reading and writing, was considered a worthy object of pursuit by any except those who, in some form or other, were destined to be drawn within the clerical ranks. The Reformation introduced the idea of educating the masses of the people—the leaders of this movement being, no doubt, forced to this conclusion by their view of man's personal religious obligations. It was manifestly a corollary from the position they took up that *every man's* intellect should be so trained as to be able to read, and inquire, and think for itself. It was only very slowly that so large a conception of the sphere of education could be brought into effect. Gradually, however, popular schools arose in many parts of the continent of Europe, especially in Germany, and the number of gymnasia, or grammar-schools was, during the same period, increased. In Scotland, so early as 1696, the government took up the matter, and ordained that there should be a school as well as a church in every parish, at the same time providing for their maintenance by a tax on land, and for their management by putting them under a certain number of those who paid the tax conjoined with the minister of the parish—all being subject to the presbyteries within whose bounds they were situated. The example of Scotland cannot be said to have been followed on anything like a national scale by any country till after the French Revolution had exhausted itself. Since 1815, the distinguishing



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idea of govt. administration may be said to be the necessity of educating *the people, and all the people*—even the outcast and the criminal. During the last 60 years, all the German states, especially Prussia and Saxony, have developed excellent national systems of education, and France has followed their example. Russia and the new Kingdom of Italy also are now organizing primary instruction; and at the same time, as in all European countries, they are making provision for the instruction and professional training of the teachers in normal schools (q.v.). The schools for instructing the middle classes, and grammar-schools (French, *lycées*; German, *gymnasiums*), whose object is to prepare pupils for the universities, have received increased attention. Universities themselves, too, have been further developed, their curriculums extended in range, their objects elevated, and their number increased.

In England, the term national education commonly implies provision for the instruction of children of only the poorer classes. But it is capable of a much more extensive application, and in most of the countries in which the state provides for the education of the people, the state regulates, more or less, all instruction, from that of the primary school to that of the university. In England national education in this sense has no existence. The parish schools (q.v.) of Scotland at one time were almost national, but the altered circumstances of the country gradually deprived them of that character. For the imperfect means adopted to supply the deficiency in both parts of the kingdom, see PRIVY COUNCIL, COMMITTEE OF, ON EDUCATION. In Ireland the foundation of a really national system was laid 1833 in the 'National Schools' (supplemented since by the Queen's Colleges and University); for the principle of which, see IRELAND. The theory of this system involves the separation of the religious from the secular teaching. The extent of encroachment on this theory in working out the scheme is not accurately known, but is worthy of special inquiry. These schools have had steady and surprising progress against determined opposition from powerful ecclesiastical parties, both Rom. Cath. and Protestant. In several of the British colonies the local legislatures have boldly dealt with the question on the national principle, in opposition to the denominational. See VICTORIA.

In Great Britain, for a long time there were peculiar obstacles in the way of the establishment of any national system of education; and these it will be instructive to consider, as a somewhat similar problem is presented in the United States and some other countries. In the first place, interference with education on the part of the state, has until lately been opposed on principle by a numerous and respectable body of British politicians, for the most part Dissenters, who, beginning with Voluntaryism in ecclesiastical matters, had passed on to the doctrine of *laissez faire* in politics. The other opposers were chiefly speculative persons, deeply imbued with the same doctrine, who profoundly disbelieving in the wisdom of statesmen, and the

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capacity of officials, and apparently in the possibility of foresight in large affairs, held that the state should undertake as little as possible, and leave things to what they call their natural course. The arguments used by these two classes were not always alike. Individuals of the former class were apt to go back to the religious ground from which they started, maintaining that education ought to be religious, that the state ought not to teach religion, that therefore education was out of the province of the state. But what the spokesmen of both classes insisted most on was this, that education should be left to the law of supply and demand, rather, to the voluntary action of individuals single or combined. It was in that way, they declared, that the education of the people could be most beneficially carried on; for so carried on, it would always be, both in kind and in extent, what, on the whole, the circumstances of the people required. In the hands of government, they said, an educational system must be, more or less, an instrument of state. And at the best, the extent and the quality of the instruction provided must depend upon the will of persons who might be ignorant of the wants of the people. They used declamation about the bad way in which governments did everything that they attempted; about the danger of creating a host of new officials; and about the impropriety of interfering with natural laws, and of discouraging voluntary agency. Then they enlarged upon the great progress which education had made in England since the beginning of this century, independently, as they said, of the state—maintaining not only that it had been as great as the circumstances of the country permitted, but that it was almost as much as the state had accomplished in any country; and that it proved that in England, supply and demand, or the voluntary principle, would soon provide for the education of the whole people. The greater part of the increase in the supply of education, so far as it was not due to the action of the state, had come from the benevolent exertions of individuals. But their chief reliance was upon the agency of individuals or societies inspired by benevolence or religious zeal. They held that the same objections did not apply to voluntary organizations which lay against the state; they declared that it was the glory of England to accomplish by such means things which elsewhere were attempted only by the state. Combined voluntary action, they said, was consonant with the national habits and institutions; it was part of the system which had made the English a free, self-reliant, and enterprising race; it should be fostered, not discouraged; and it was worth while to pay a price if necessary, rather than let it be superseded by the action of the state.

It was answered, first, that the commercial principle of supply and demand, unless supplemented by the benevolence of individuals, could not be expected to provide education for the people except by very slow degrees; that education must create the demand for education, that children of the lower classes in large towns, unless assist-



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ance or stimulation came to them from without, had at present no more chance of receiving instruction than if they were living in Africa. And the nation would lose incalculably by delay in educating the masses; for nothing would so greatly increase its power and prosperity, so materially improve the condition of the humbler classes, as the education of the whole people. The importance of voluntary agencies was admitted; but why was the state to be precluded from at least co-operating with them? The state, it was said, had a greater interest in educating the people than any of her citizens could have; and, moreover—this was the real question—could undertake it more successfully. Voluntary agency, it was maintained, was too slow, too uncertain, too spasmodic in operation, to be permanently and solely relied upon in a matter of such great national concern. The friends of state action confidently appealed to the experience of foreign countries as showing the superior efficiency of state education, and pointed to the effects which government stimulation, on a limited scale, had had in Britain. It is now several years since this controversy was at its height. The Voluntaries have since that been acquiescing in the interference of the state with education; and recently, several of their foremost men have frankly admitted that they had made a mistake, and that the state, by what it has done for education, has made good its claim to the regulation of it. The course of political events has recently added greatly to the importance of popular education; and at present it may be said that there is practically no opposition upon principle to the control of education by the state.

There have always, however, been other obstacles, which long seemed inevitable, to the establishment of a national system in Britain.

The most important of the obstacles are those concerned with the place, if any, to be assigned to religion in the school instruction. On this there is a conflict of opinions which has seemed almost irreconcilable. A party, growing in numbers, and respectable from its activity and intelligence, holds that the state should give nothing but secular instruction; that religion is beyond its province, and should not be taught within its schools; that, indeed, with a population divided into numerous sects, a practicable scheme of state education embracing religion cannot be devised. To this party, a portion of the English Voluntaries has seemed disposed to ally itself. There are others who believe it possible to teach an undenominational Christianity in schools; who desire that the state schoolmaster should confine himself to this; and that dogmatic teaching should be left to the religious bodies. A third party hold that dogmatic teaching should be given in state schools; that religious teaching, to have any value, must be dogmatic; but that arrangements might be made for the religious instruction of children by persons of their own persuasions; and, at any rate, that children should be exempted from the religious instruction given in a school, if their parents so desire. The most numerous body of all were satisfied with

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the old system of aiding denominational schools; because they approved of schools being mostly under clerical supervision, and feared that by any change the influence of the clergy upon the education would be weakened. Among the managers of Church of England schools, fault is scarcely found with more than one point in the old substitute for a system; there was an incessant agitation against the 'Conscience Clause,' which the state has placed among the conditions of its aid, stipulating that religious instruction should not be given contrary to the wish of the parent. Between the Denominationalist and the Secularist there is a difference which scarcely admits of compromise, and which has been found a serious hindrance in the way of any national system. The former was naturally opposed to any scheme for supplementing the Denominational system—for educating the classes which that system did not educate—unless it included religious teaching.

It is encouraging therefore to note that in face of all the obstacles, the claims of national education have been more fully recognized; and that, with less opposition than might have been expected, a national system has been established in England and Scotland. The Elementary Education Act for England, 1870, enacts that every district in which the existing schools are found deficient shall have a popularly elected school-board, to manage its rate-supported schools, levy school-rates, appoint teachers, etc. Elementary schools are to be supported, and the expenses of school-boards paid out of funds called school-funds. The local rate forms the nucleus of each school-fund; but every school under the act is likewise entitled to an annual grant from parliament not exceeding the income of the school from other sources, and varying in amount according to the number of pupils and their proficiency as tested by different standards of examination. Schools are to be open at all times to government inspection. Religious instruction, if given at all—and this is left to each board to decide—is to be given at fixed times other than the ordinary school-hours, and when no child is compelled to attend. It is further left to the discretion of school-boards to make education compulsory.—The Scotch Education Act, 1872, differs materially from the English act on three points only: first, by providing that a school-board, under the Scotch Education Dept., is to be elected in *every* parish and burgh; secondly, by making it illegal for parents to omit educating their children between 5 and 13 years of age in reading, writing, and arithmetic; and thirdly, by comprehending higher-class schools. Otherwise, the acts are much alike. Every school is to be open to children of all denominations, and religious instruction is to be given only before or after ordinary school-hours. Provided there is conformity to the 'conscience clause,' school-boards may make any provision that they please for religious instruction. School-boards are enjoined to relieve the teachers of higher-class schools, so far as may be, from elementary work.

The question of religious instruction has been found troublesome in nearly every country where the state requi-



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lates education, and there is instruction to be gained from the ways in which, in different systems, this difficulty has been met. Next in importance is an observation of the parts which in different systems are assigned to the state and to the locality respectively; for it is unquestionable that there are some dangers attaching to state education, when the influence of the state is predominant, and that the function of the state in education must be carefully defined. By the mere selection of school-books, the state could powerfully influence the rising generation; and in Austria, and, it is said, in France also, the school has been made use of as an instrument of state policy. With a popular government, however, there is not much risk of its use for sinister purposes; and under such a government there is probably more danger of having recourse too little to the powers of the state than of trusting it too much. The possibility of making education compulsory, is another matter on which various systems of education throw much light: there is perhaps more interest in noting how far indirect methods can be resorted to for compelling attendance at the schools. Upon the limits of the instruction which should be attempted in schools for the poorer classes—a subject which has been much discussed in Britain in connection with recent changes—and upon the results of government regulation of the middle and upper schools also, there is much to be learned from the various national educational systems.

### *State Education in Holland.*

There are several countries in which—if school statistics could be taken as a test—popular instruction is more widely diffused than in Holland; but in no European country is it so uncommon to meet a man who cannot easily read and write. The primary schools of Holland have high reputation for solidity of instruction, and have, by competent observers, been declared the best in Europe. In that small and wealthy state—rich, too, in the public spirit of its citizens—with a population singularly docile and orderly, the task of educating the people has been exceptionally free from difficulty. It had the start of most other European nations in the work of popular education. So far back as 1811, its primary schools had been celebrated in a report by the famous Cuvier. It has had an education law since 1806; and of this law, though it underwent modification 1857, it is necessary to give some account. Secondary education in Holland was officially instituted and organized for the first time by the law of 1863, May.

On the face of it, the law of 1806 seemed far from making complete provision for the education of the people; it left much—in any other country, it would have been a great deal too much—to the public spirit of local authorities. It did not make education compulsory; it did not even enforce the establishment of public schools; but it provided for two things being done thoroughly—the inspection of the schools and the examination of the teachers—and to this chiefly seems to have been due its eminent success,

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Each province of Holland was formed into a certain number of school-districts, and over each school-district was placed an inspector. The inspector was made supreme over primary instruction in his district. He was a member of every school-committee, and school-committees could be named only with his concurrence; no teacher, public or private, could exercise his calling without his permission; and he inspected every school in his district twice a year. The united inspectors of the province formed the provincial commission for primary education. This commission met three times a year, and received from each of its members a report upon his district; once a year, it sent a deputy to the Hague, to form, with the deputies from other provinces, a commission to discuss and regulate school-matters, under the direction of the minister for the home dept. and his inspector-general. The inspectors in the various provinces were appointed by the home office, on the presentation of the provincial commission. It has been said that in Holland public spirit is very strong. State-employments are thus deemed very honorable; and the inspectors gave their services gratuitously—receiving only an allowance for expenses. It was one of the duties of the provincial commission to examine teachers for certificates. First, the teacher had to get a *general admission*—a certificate of competency, admitting him into the teaching profession; he had to get a *special admission* also, before he could exercise his profession. There were four grades of certificates—the first or second grade had to be obtained by a school-master, public or private, in the towns; the third grade qualified for a village-school; the fourth grade was for under-masters and assistants. To the highest grade were admitted those candidates only who gave signs of a *distinguished culture*. For public masterships, when they fell vacant, a competitive examination was held: the successful candidate received his *special admission*—his appointment to exercise his profession in the school. For special admission as a private teacher, there was no second examination; it was in the power of the municipality, with the concurrence of the inspector, to grant it upon application. Although there were no obligatory provisions in the law, the provincial and communal administrations were charged by the government to provide the means of instruction in their localities, to insure a comfortable subsistence for teachers, and to obtain a regular attendance of the children in the schools; and they did all this to the best of their ability. Free schools for the poor were provided in the towns; in the villages, schools to which the poor were admitted gratuitously. Every effort was used, both by the lay authorities and by the clergy, to draw poor children into the schools; and the schoolmasters were provided with incomes much superior to what is usually paid to schoolmasters in any other European country. To this M. Cuvier attributed much of the success of the Dutch schools. Some of the best scholars were kept in the school to assist in the teaching; they became under-masters, and eventually masters; and thus, even before the institution of normal



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schools, an efficient body of teachers was provided. In the normal schools afterward established, school-methods and the practice of teaching formed a more prominent part of the instruction than in those of other countries. It soon appeared, that the free schools for the poor in towns were giving better instruction than could be obtained by the lower middling classes; and intermediate schools had to be established in the towns (*tusschen-schoolen*), in which, for a small fee, an excellent education was provided. Above the intermediate school was the French school, in which, besides a sound commercial education, modern languages were taught; above that was the Latin school, giving a classical education, and preparing for the universities. The classical schools and the universities of Holland do not receive from foreign observers the commendation so freely bestowed upon the other parts of the educational system of the country.

Under this law, the public schools were non-denominational; no dogmatic instruction was to be given by the teacher or in the school; but the instruction was to be such as to 'train its recipients for the exercise of all social and Christian virtues.' The religious education of the children, however, was not overlooked. The government exhorted the clergy of the different communions to take upon them the religious instruction of children of their own persuasions; and this the clergy willingly did—giving up a portion of every Sunday to this duty. The schoolmaster instructed the children in the truths common to all religions, and on Saturdays, when the Jews were absent, in the New Testament and the Life of Christ. M. Cuvier, 1811, stated that he found the education religious, though not dogmatic; and in 1836, high satisfaction with it was expressed by M. Cousin, earnest advocate of religious education. It was thought that the Dutch schools had proved the possibility of teaching in schools an unsectarian Christianity. But it was chiefly upon this point that the controversy arose which led to the enactment of 1857; and it cannot yet be said that the controversy is ended.

There were other matters which excited a demand for the alterations then made in the law. The constitution of 1848 had granted the liberty of instruction, and was therefore in conflict with the law of 1806. The school-attendance had been falling off. Some of the municipalities had been evading their duty to the schoolmasters and the schools. It was thought desirable that the duties of the commune in regard to education should be carefully defined by law. The changes made, however, were not of much practical importance.

The law of 1857 granted 'liberty of instruction,' still requiring from the private teacher the certificate of competency, it rid him of the veto of the municipality and the inspector. It expressly prescribes that primary schools, in each commune, shall be at the commune's charge; they are to be in sufficient number; and the states' deputies and the supreme government are to judge whether, in any commune, they are in sufficient number or not. If the charge

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of its schools is too heavy for a commune, it receives a grant in aid, of which the state and the province each contributes half; but there is no fixed point at which the commune can demand this aid. The law fixes the minimum salary for a schoolmaster at 400 florins (about \$165); for an under-master at 200 florins. (The schoolmaster's salary, however, is usually much higher; in towns, not unfrequently four times as much.) It provides that when the number of scholars exceeds 70, the master is to have the aid of a pupil-teacher; when it exceeds 100, of an under-master; when it exceeds 150, of an under master and assistant; for every 50 scholars above this last number, he is allowed another pupil-teacher; for every 100 scholars, another under-master. School-fees are to be exacted only of those who can afford to pay them; and the municipalities are enjoined to 'provide as far as possible for the attendance at school of all children whose parents are in the receipt of public relief.' The law defines the subjects of primary instruction as follows: Reading, writing, arithmetic, the elements of geometry, of Dutch grammar, of geography, of history, of the natural sciences, and singing. There is still a competitive examination for the office of public schoolmaster; a list of those who have acquitted themselves best is made up by the inspector and a committee of the communal council, and from this list the selection is made by the whole body of the council. For the provincial commission, consisting of the inspectors of the province, there has been substituted a salaried provincial inspector; and the provincial inspectors are assembled once a year to deliberate upon the state of primary instruction. The minister of the home dept., assisted by a referendary, is the supreme authority in matters connected with education.

Upon the subject of religious instruction, the law was left unaltered. The enactment of 1857 provides as follows: 'Primary instruction, while it imparts the information necessary, is to tend to develop the reason of the young, and to train them to the exercise of all Christian and social virtues. The teacher shall abstain from teaching, doing, or permitting anything contrary to the respect due to the convictions of Dissenters. Religious instruction is left to the different religious communions. The schoolroom may be put at their disposal for that purpose, for the benefit of children attending school, out of school-hours.' This was the conclusion arrived at, after much excited discussion.

In 1848, all religions were, in Holland, placed by the law on perfect equality, and immediately thereafter, an attack was begun by the Rom. Catholics on the religious instruction of the schools. They maintained that though it was professedly neutral, it was really Prot., and probably they were right. The schoolmasters, on the demand of the Rom. Catholics, were enjoined to comply more strictly with the law; and thereupon there began among the orthodox Protestant bodies a violent agitation against the law—a movement for connecting every public school with some religious communion. The Rom. Catholics, believing that



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in Holland neutral schools must be Prot., desired that the instruction should be purely secular; and a considerable party among the Protestants contended for the same object. The only party in favor of the existing law were the Rationalist or New-school Protestants, who attach more importance to the moral and civilizing side of Christianity than to its dogmatic aspects. Between the Denominationalists on one hand and the Secularists on the other, the victory fell to this last party. Of course, the decision was a compromise; and neither the High Prot. party nor the Rom. Catholics regard it with satisfaction. The consequence has been that, advantage being taken of the newly-conceded freedom of instruction, there has been a great increase in the number of private elementary schools conducted on the denominational basis. The non-denominational school in Holland cannot be considered entirely successful, since the opposition to it seems to be leading to primary education being to a considerable extent taken out of the control of the state.

### *State Education in Switzerland.*

In no part of Europe has the education of the people been more successfully prosecuted than in Switzerland. In all the cantons, French and German, it has been carefully attended to by the governing bodies; and for small communities, provided the rulers have intelligence and public spirit, it is comparatively a simple and easy task. To those who are interested in school-methods and school-management, nothing can be more instructive than the education of the German Swiss cantons. Their primary schools are unsurpassed; those of the canton Aargau have the reputation of being the best in Europe. The experience of the French Swiss cantons throws light on more than one of the questions which occur in the construction of a national system. It is with the latter class of questions that we are concerned; and to the French cantons—Geneva, Vaud, Freiburg, Neuchatel, and the Valais—the following statement is confined.

In these five cantons, the school system was, until recently, the same in its main outlines; it was a system designed to put public education in harmony with the democratic constitutions established after the war of the Sonderbund. In Vaud, it was founded 1846; in Geneva and Freiburg, 1848; in the Valais, 1849; and in Neuchatel, 1850. In Freiburg, it underwent modification 1856. Its main features were as follows: The communes were required to provide and maintain public schools, the state assisting them when the charge became too heavy. In general, every place with more than 20 children of school-age was required to have its school; every place with more than 50 or 60, a second school; and so on. Infant-schools were recommended and aided by the state, but their establishment was not made obligatory. The council of state—the supreme executive—of the canton appointed a board of public instruction to exercise the government of education; but in important matters, an appeal lay from this body to the council; and

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by the council only could a master be dismissed. The municipality appointed a communal school-committee, which had the local superintendence of the schools. Ministers of religion were eligible for this body, but were not members of it by virtue of office. It was the duty of the school-committee to visit the schools of its commune not less than once a fortnight, besides holding a public general examination of them once a year. The teacher was required to get a certificate of capacity; the examinations for the certificate being under the management of the Board of Public Instruction. In Vaud, however, five years' service in a public school exempted a teacher from the obligation of a certificate; and in other cantons, it does not seem to have been rigidly insisted on. For vacant masterships, there was a competitive examination, to which persons qualified by certificate or service only were properly admitted; in Vaud, however, failing qualified persons, other candidates might be admitted to examination, and provisionally appointed. In Geneva, Freiburg, and the Valais, there were school inspectors who periodically reported to the board of public instruction; Vaud and Neuchâtel had no inspectors; the duty of inspection in these cantons devolved on the school-committee. The subjects taught were religion, reading, writing, grammar, arithmetic, and book-keeping, geography, Swiss history, and singing. The instruction given had two or more degrees (in Geneva, six degrees), according as these subjects were taught with more or less extension; instruction in both degrees being usually given in the same school, and by the same master. Education was to be based upon the 'principles of Christianity and democracy' Hours were to be set apart for religious instruction; from the ordinary school-lessons, dogma was to be strictly excluded; and it was regarded as the province of the minister of religion, not of the schoolmaster, to give religious instruction, though the latter was not prevented from giving it in the room of, and under the responsibility of a minister. In all the cantons, except Geneva, education was made compulsory; attendance at school was required from the seventh to the fifteenth, or from the eighth to the sixteenth year of age. If children were privately educated, the state must be satisfied that their education was sufficient; such children could be called up for examination with the scholars of the public schools, and if found inferior, might be transferred to a public school. A certificate of emancipation was granted when the obligatory course had been fulfilled. The law contemplated that the instruction should be gratuitous, and in Geneva and the Valais it was gratuitous.

In Freiburg, the school-system was framed in no small degree for the purpose of strengthening the democratic party against the clerical party. It provided that no religious society should be allowed to teach; that persons educated by the Jesuits should be incapable of holding any office in church or state; it imposed a political oath upon the schoolmaster; it prohibited children from being sent to a private school, except with the sanction of the inspector and the



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school-committee; and if sent, required that they should come up for examination every half-year. At the same time, it established an excellent programme of primary instruction. At the elections of 1856, the clerical party regained the ascendancy in Freiburg; and in 1858, Jan., the council of state made a considerable alteration in the school-law. It reduced the programme of primary instruction; it made the clergyman a necessary member of the local school-committee, freed the teacher from the necessity of taking an oath, and relaxed the obligation of attendance at the public schools, giving parents liberty to educate their children at home or at private schools. In other respects, the system, as above described, has been maintained in Freiburg. There has been no change in the other cantons.

The law as regards religious instruction seems to work with a reasonable degree of smoothness. In Vaud, it appears that the laxity which prevails as to the requirement of a certificate sometimes leads to the admission of unqualified persons as teachers; and in Vaud and Neuchâtel, complaint is made of the incapacity of the school-committee to make up for the want of professional inspection.

In the four cantons in which education is by law compulsory, the school-attendance is found to be no better than in Geneva, where it is not compulsory. In these cantons, the law provides that parents not sending their children to school are to be warned; if the warning be neglected, that they are to be summoned before the tribunals, which can punish them by fine or imprisonment. But it appears that, in point of fact, the tribunals are never resorted to; and that the authorities are careful not to insist upon more than the people are easily able and willing to comply with. In the Valais, the school-year need not last more than five months. In Freiburg, the vacation may last three months; and the inspector may exempt from attendance at school children who are sufficiently advanced, and children whose labor their parents cannot dispense with. In Vaud, the local school-committee may grant to children above 12 years of age, whose labor is necessary to their parents, dispensations which in great measure exempt them from attendance at school; the master may grant the scholar leave of absence for two days in the week; the president of the school-committee may grant him leave for a week at a time; the school-committee itself for a month at a time. It appears that in Vaud, the attendance at the schools had been steadily falling off from 1846, the date of the law, till 1858; and the attendance of the children whose names were on the books was then reported to be by no means regular. New branches of industry which gave employment to children had been introduced into the canton; and the council of public instruction seems to have been compelled to sacrifice the law to the interests of families. The experiment of compulsory education cannot be said to have succeeded, because it has not really been made, in French Switzerland.

### *State Education in France.*

The head of the educational system of France is the

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minister of public instruction, a member of the imperial council under the empire, and of the president's cabinet under the republic. The system comprises primary, secondary (which includes the classical and industrial) and high grade instruction, beside the purely military, and is administered by the general govt., the dept., and the commune. Free education is provided also by private institutions. Under existing laws (1888), every commune having 500 inhabitants or more is obliged to maintain one school for boys and another for girls, in which primary instruction is given by lay teachers appointed by the prefect. Such a commune also must provide schools in which children under 7 years of age may be prepared for the communal primary school. In the 87 depts. into which the country is divided, there are 81 primary normal schools, nearly 1 for each dept., in which teachers are trained for the communal schools. In 1886 there were 53,000 communal schools and 16,000 free schools, giving primary instruction to 4,000,000 pupils. Secondary instruction is provided by the general govt., the communes, and several religious orders authorized to conduct educational institutions, which are wholly or in part supported by the govt. The institutions of this grade established by the govt. are known as lyceums, and are usually situated in the capitals of the dept. They numbered (1886) 75, and contained between 20,000 and 25,000 students. The communal institutions, known as colleges, numbered 250 and had 25,000 students; and those carried on by the religious orders and by laymen, called seminaries, numbered 1,000, and had more than 60,000 students. The classical and industrial branches of the secondary institutions are provided with professors specially trained in the high normal school (classical), and the special normal school at Cluny industrial), both established and supported by the gen. govt. These schools are authorized to grant diplomas and degrees of bachelor of letters and bachelor of science. High grade, or superior instruction, embracing the highest branches of human knowledge only, is given in the universities (*facultés*), the professorships of which are intrusted to men of tried capacity and talent. These universities number 15 for literature and science, 10 for law, 7 for theology, and 3 for medicine; and grant degrees of bachelor, licentiate, and doctor. Candidates for the Rom. Cath. priesthood are educated in theological seminaries under exclusive control of the bishops. There is a Prot. seminary at Montauban for the education of clergymen, and several institutions that graduate rabbis for the Jewish congregations. The gen. govt. supports the clergy of the Rom. Cath. Church, and those of the Prot. and Jewish communions, and maintains theological seminaries for them. There is also a territorial circumscription of public instruction in each of the 16 national districts, known as an academy, where the administration is vested in a rector, assisted by an academical council, and having under his authority an inspector of the academy who is aided by a departmental council presided over by the prefect, and



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several inspectors of the communal schools. Public instruction is greatly facilitated by the libraries established in nearly all towns, communes, primary and regimental schools, and in the museums. Independent and special studies are pursued in the College of France and the Museum of Natural History, both in Paris; and the Conservatoire des Arts and Métiers may be classed as an industrial university. Military schools are maintained at St. Cyr, La Flèche, and Saumur; the Polytechnic School in Paris educates military, artillery, and naval officers, and civil engineers; there are numerous practical schools for artillery and engineering study; and a great number of regimental schools for the army. These are under the supervision of the minister of war. Other practical schools connected with the navy, civil engineering, mining, manufacturing, etc., are controlled by the ministers to whom they more properly belong. There are also in Paris the Central School of Arts and Manufactures, for civil engineers; the School of Fine Arts, for painters, sculptors, and architects; the famous Conservatoire, for actors and musicians; and the school for living Oriental languages, attached to the great library. The leading special schools outside of Paris are 3 schools of arts and trades, 3 of agriculture, 3 for veterinary surgeons, 1 of horticulture, 1 for miners, 1 for mining engineering, several of fine arts, and a number of communal and private institutions of note, such as the schools for drawing, the Central School in Lyon, and the watch-making school in Besançon. The govt. also maintains two schools in Rome, one for artists, sculptors, painters, architects, and musicians, appointed after competitive examination; the other for students of ancient literature, who are selected from among the advanced scholars in the high normal school; and one in Athens for a similar class of students. Above all these institutions is the great Institut de France, composed of 5 academies, the Académie Française, Académie des Inscriptions et Belle Lettres, Académie des Sciences, Académie des Beaux-Arts, and Académie des Sciences Morales et Politiques. Excepting the Académie des Sciences, which has 66, each of these contains 40 members, chosen by themselves, a new member being elected whenever one of the members dies. As the membership of these academies is never increased and the members usually live to a ripe old age, they are popularly known as the '40 immortals.'

The minister of public instruction, if he thinks fit, brings before his council and the inspectors general for discussion projected laws and decrees on public education; he is bound to consult the council respecting the programmes of study, methods, and books to be adopted in all classes of public schools. The minister has succeeded to the functions in respect of education which, under the first empire, were conferred upon the Univ. of France; he is head of the univ., the officials of which still perform a considerable part in the management of education, but under his control. As respects the higher and the professional education, the univ. is both a teaching and an exam-

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ining body, granting degrees under conditions prescribed by the minister and council. The administration of the secondary instruction is committed to it, and it shares in the supervision of the primary instruction. It is composed of 16 *Academies*, each of which comprehends several departments. These academies are so many local centres of the department of public instruction.

The academy officials, under the control of the minister, have the superintendence of secondary instruction in the departments within the academy's jurisdiction; there is an inspector for each department. The instruction is minutely regulated, as to the quantity to be provided, as to the subjects to be comprehended in it, and as to its cost; it is the chief duty of the academy inspectors to see that the requirements with respect to it are complied with. The lyceum is the principal seminary of secondary instruction; it is founded and maintained by the state, with aid from the department and the communes; the communal college is founded and maintained by the commune, with occasional aid from the state. The instruction given in the communal college and in the lyceum is substantially the same in character; in the lyceum it is the more extensive. In both lyceums and communal colleges, there are boarders and day-scholars. French, Latin, Greek, and mathematics are the principal subjects of instruction; arithmetic, history, geography, modern languages, and the natural sciences also are taught. The course at the lyceum lasts six years. There are public scholarships (*bourses*) founded by the state, to be obtained by competition, the holders of which are relieved from all cost of tuition and board. A private secondary school cannot be opened without notice to the public authorities: they must be satisfied that the premises are suitable; and the director must have a certificate of probation—showing that he has served five years in a secondary school—and a certificate of competency obtained at the public examination for secondary teachers. The academy inspector inspects private secondary schools, but only to see that the pupils are properly lodged and fed, and that the teaching contains nothing contrary to morality and the laws. The minister may, however, dispense with the certificate of probation, and holy orders are accepted in lieu of the certificate of competency.

A law, dated 1865, June 21, founded a new course of study in secondary schools—a special secondary instruction. The object of the special secondary instruction is declared to be to ‘found the sub-officers of industry;’ instruction in living languages is substituted for the classical instruction of the secondary schools; the elements of science and its applications receive great attention—particular regard being had to the teaching of agriculture and the sciences which bear upon it.

For primary instruction in France, an excellent basis was laid by M. Guizot's law, 1833, of which, the more important provisions have been retained. Since the re-establishment of the French republic, education has repeatedly been the subject of legislation; in the main, the provisions



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as to primary education are regulated by the laws passed 1850-67. Every commune must have taxed itself specially for its schools three centimes per franc of rental before it can claim govt. aid; the department must have taxed itself specially two centimes for the communal schools before the state is resorted to. Till within a few years, a certain number of poor children—the number determined for each school by the prefect of the department—were admitted to the school gratuitously; for others, a fee was charged, collected every month by the tax-gatherer. The state contributed whatever was necessary in addition to the communal and departmental taxation and the school-fees. A later law, however, provides that all children are to be admitted gratuitously whose parents would have difficulty in paying the school-fee; and that a commune whose taxation amounts to four centimes additional may dispense with the school-fee altogether, any deficiency so arising being made up by the state. Until 1867 the law did not oblige the communes to maintain separate schools for girls, though a large proportion of them contributed toward the maintenance of such schools.

Religious instruction is given in every school. As the Rom. Cath., Protestant and Jewish forms of worship are subsidized by the state, it is provided that, in communes where more than one of these is publicly professed, each form is to have its separate school. The departmental council, however, has power to authorize the union, in a common school, of children belonging to different communions. For such cases, it is provided that ministers of each communion shall have free and equal access to the school, at separate times, to attend to the religious instruction of members of their own flock. To a school appropriated to one denomination, no child belonging to another is admitted, except at the express demand of his parent or guardian, signified in writing to the teacher.

The mayor and the minister of religion in each commune have the supervision and moral direction of the primary school; in practice, they are strictly confined to matters connected with its morality. Cantonal delegates are appointed by the departmental council (the canton is a division larger than the commune), who inspect the primary schools of their canton; but they have no real authority over the schools; they are allowed only to make representations as to the state of the schools to the departmental council, or to the inspector. The departmental council has the chief part in the regulation of the primary schools; moreover, no private primary school can be opened without its permission; and if it refuse permission, there is no appeal. It is the prefect, however, who has the power of nominating, suspending, and dismissing public primary teachers. His authority is usually exercised upon the report of the academy inspector—the university official whose important functions, in respect of secondary instruction, have already been described. The academies have the charge of the normal schools of primary instruction, and the supervision of the primary schools as regards

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the methods of teaching and course of study. Under them are the primary inspectors, who report to the academy inspectors; above the latter, as regards primary instruction, there are 18 inspector-generals attached to the office of the minister of public instruction. It is the primary inspector who really superintends the instruction in the schools; his labors are unceasing, his inspection is a reality, for he is not required to give notice of his visits. The private primary schools are subject to his inspection, but only as regards the provision made for the bodily health and comfort of the pupils and the maintenance of morality.

The subjects which must be taught in every primary school, in addition to moral and religious teaching, are reading, writing, arithmetic, the elements of French grammar, and the French system of weights and measures; there are other subjects which are facultative—i.e., which, in whole or in part, may be taught, if the council of the commune should so desire, and the departmental council gives its consent. These facultative matters are the applications of arithmetic; the elements of history and of geography; the elements of physics and of natural history; elementary instruction in agriculture, the arts, and hygiene; surveying, levelling, drawing, singing, and gymnastics. In girls' schools, instruction is usually given in needle-work about three hours a day.

The examination for primary schoolmasters—which is conducted by a commission appointed by the departmental council—is limited to the subjects taught in the schools. There are two classes of certificates, according as the teacher passes in the obligatory subjects only, or in the whole or part of the facultative subjects also. Every male teacher, public or private, is required to have the certificate of capacity granted after an examination; also, excepting in the case of 'religious' persons, a certificate of morality. The law recognizes a certificate of stage, to be granted to assistants who have served as such for three years, as a substitute for the certificate of capacity; but this provision has been unpopular, and the qualification of stage is practically unknown. Female lay teachers must have the certificate of capacity; female teachers of the religious orders are exempted from it. No person can be appointed a regular communal teacher unless he be 24 years old, and have served three years since his 21st year as an assistant, or as a *supplying* teacher. The supplying teacher gets a lower salary, and may be employed in the poorer communes. The salaries are low even in the towns.

In secondary instruction the education of France has a decided superiority over that of England. The primary instruction is scarcely equal to that given in English schools of the same grade. Matthew Arnold reported that, in 1859, he found in French primary schools the writing fair, but scarcely so good as in English schools; the reading better, the arithmetic much better, than in English schools. Of history and geography, the pupils were far more ignorant than English school-children of the same age. Mr. Arnold came to the con-



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clusion, that even in the great towns there were no masses of children left altogether uneducated, that almost all passed at some time through the schools. For means of higher education in France, see UNIVERSITY OF FRANCE.

Since 1880 radical changes have been made in the relation of the religious orders to public education. Soon after the appointment of Jules Ferry to be minister of public instruction and fine arts, 1879, he prepared an educational bill which contained a clause prohibiting members of unauthorized religious communities from teaching or managing any educational establishment. The measure was adopted in the chamber of deputies, July 20, by a vote of 363 to 166, but the opposition in the senate, led by Jules Simon, resisted this clause, and the bill was laid over. In 1880, the clause was inserted in a new bill, and, as before, passed the deputies by a large majority and met an unpromising opposition in the senate, Mar. 9. But Minister Ferry subsequently gained his point by resorting to some old laws that had fallen into disuse, and the proscription of the principal order in view—the Jesuits—was proclaimed. The following is the obnoxious clause:

‘Art. VII.—No person belonging to an unauthorized religious community is allowed to govern a public or private educational establishment of whatsoever order, or to give instruction therein.’

There were in France three distinct classes of religious societies. First, religious congregations recognized as such by the state, but not authorized to teach. Second, societies recognized not as religious congregations, but as charitable institutions, organized to promote primary instruction and recognized as establishments authorized to teach. Third, religious congregations not recognized as such, and having thus an illegal existence and giving instruction without authorization from the state. It was upon the latter class chiefly that Ferry’s Art. VII. bore. At that time the Jesuits had 27 schools with 9,000 pupils, and the other non-recognized religious communities had 7,854 pupils under instruction. Ferry claimed that Jesuistic teachings were inimical to the republic. Jesuits taught, he said, that the church was supreme over the state; in their textbooks it was set forth that the Inquisition had never condemned any one to death; that feudalism had been beneficent in its character until feudal rights were unjustly usurped by the state, and many such perversions of fact and history.

The Rom. Cath. world generally protested against the proscription, but it was carried out, and many Jesuits who did not submit gracefully were forcibly removed by the prefects backed by soldiers. The acts of the govt. were again hostile to the religious orders and particularly to the Rom. Cath. Church, 1883; and in 1902-3 there were many disturbances in consequence of attempts to close the 2,500 or more schools which had not conformed to the Association’s laws. In some cases the teachers were forcibly expelled by soldiers.

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### *State Education in Prussia.*

In all the Prot. states of Germany, the school-system in its main features is the same. The Prussian system—more celebrated, more extensive, more practical and thorough than the system of the minor states—always powerfully influencing these, and now likely to influence them more than ever, is that which must be selected for description. About this system, M. Cousin, by a strange confusion between it and a project of law—a mere scheme drawn up by the education minister, Von Altenstein, never even proposed for legislation—spread misconceptions throughout Europe, which have scarcely yet been dispelled. It has been greatly changed, greatly improved since Cousin wrote in 1831; but it does not yet in symmetry and completeness approach to what he described.

In Prussia, there is a minister of public worship and instruction; but the officials who under him carry on the government of education are the officials of the dept. of the interior. At the head of the government in each province is a pres.; over each of the depts. into which the province is divided there is a prefect (*bezirk*); each of these officers is assisted by a council, of which one section, called *Schulcollegium*, forms a separate council for deliberating upon the local school-affairs. One member of the school-council, called provincial school-councilor, is associated with the pres. for administrative purposes: the prefect has attached to him two departmental school-councilors, one Prot., one Rom. Cath., to advise with him, and to administer the school-affairs of their respective communions. There is practically a division of educational affairs between the officials of the province and those of the department. The provincial school councilor takes charge of secondary education within the province; the departmental school-councilors take charge of the primary schools of the department.

Over each of the circles into which the dept. is divided is an officer, termed a *Landrath*, who reports to the prefect of the department. With the landrath, in the management of primary schools, is associated the *superintendent*, the church dignitary of the circle. The superintendent is *ex-officio* inspector of the primary schools within the district. The parish clergyman is *ex-officio* local inspector of primary schools within his parish. There is also for the school or schools of each parish a board of managers the composition of which varies in different provinces. The clergyman is always a member of it: he is usually chairman. In country places, the whole powers of the board are often left in his hands.

In the 'exterior' affairs of the school—passing school-accounts, visitation of school-premises, control of the school-estates, adjustment of the school-rate, etc.—the landrath is associated with the superintendent. Its 'interior' affairs, all that concerns its teaching and discipline, are, subject to the established regulations, under the superintendent's control; but, in practice, they are more under the influence of the departmental school-councilor. The supt., however,



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is required to visit the schools, and to watch over the conduct of the local inspector, and he reports annually to the government of the department. The local inspector's province is the interior affairs of the school. He is expected to visit the schools diligently, and to be active in the supervision of them. The religious teaching of the children is done almost entirely by him, it being his duty to prepare them for confirmation, which comes at the end of the school-period. To qualify them for the duty of school-inspection, the candidates of theology are required to attend for six weeks as auditors at a normal school, and to have attended a course of *Pädagogik* at the university. Nevertheless, it appears that many clergymen are very ill-fitted for this work, and that their powers of interference are often exercised in ways annoying to the master, and detrimental to the school. The 'exterior' affairs of the schools of a parish belong to the board of managers.

This board is usually composed of representatives (1) of the patrons, if any, of the school; (2) of the parochial clergy; (3) of the municipal body; (4) of the householders. It has a stated meeting once a quarter; it meets whenever it is summoned by the chairman. It manages the revenue and expenditure of the school, in respect of which it is responsible to the landrath; it is the trustee of the school-buildings and property. It is its duty to see that the regular school-hours are kept; that no unauthorized holidays are given; to it application must be made for dispensations for periods exceeding a week. Its members should be present at all examinations and other public solemnities of the school. In the large towns, there are school-delegacies appointed by the *Magistrat*, whose powers are more extensive, and are in practice the greater, because in the large towns the pastors pay little attention to the schools. The school-delegacies have control over the higher as well as the primary schools which their constituents maintain; two paid members—school-delegates—who must be members of the *Magistrat*, exercise the greater part of their authority. Under the delegacy, for every school there is a school-board, consisting of the clergyman and two lay members, whom the delegacy appoints. The delegacy itself is accountable to the magistrat, and both are subordinate to the provincial council.

Every commune is bound to find school-room and teachers for all the children of school age belonging to it. The amount of the teacher's stipend is in every case fixed by the departmental government; there is no legal minimum; the salaries are usually very low. Some parishes possess endowments; but, in general, the cost of maintaining the schools is defrayed by means of (1) school-fees, (2) a local rate, (3) a grant from the national treasury. As children are expected to pay only what they can, and as the state grants aid only after the strictest proof of the incapacity of the commune, the weight of the burden falls upon the local rate. The maintenance of the schools ranks with the first charges upon the local purse. The teacher is appointed by the departmental councilor; in a few towns,

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however, a certain power of choice is allowed to the municipal authorities—they may select one from a number of candidates presented to them by the government.

School-attendance is by law compulsory for eight years; the school-age beginning at the completion of the fifth year of age. But in most parts of Prussia, children, though allowed, are not compelled to attend till the completion of their sixth year. The school-period closes with confirmation. A register of all children of school-age is made up—usually at the police-office; every child is registered for a particular school; there, whatever his rank, he must attend, unless a dispensation be got for him from the landrath. When a dispensation is applied for, the parents must state the motives of the application, and the provision to be made for the child's education. All persons officially connected with schools are expected to use their influence to secure regular attendance; but failing moral suasion, there are other means of enforcing it. The school-master keeps a list of absences, excused and inexcused. When a child's attendance is irregular, the board of managers admonishes its parent. If admonition—which in general is repeatedly resorted to—has no effect, a statement is sent to the police-office; the parent is fined a small sum for each day of the child's absence since the last admonition; and the fine can be levied by execution, enforced by imprisonment, or taken out in parish labor. It seems that very few children escape registration; but the regularity of the attendance—in general it is very regular—varies considerably in different districts; the execution of the law being strict or otherwise according to the temper of the people, their circumstances, and the vigilance of the school-authorities. There are no statistics by which the success of the law can be exactly tested. In some of the larger towns, the demand for child-labor and the growth of pauperism are adding to the difficulty of enforcing it. Prussia has a factory-law requiring that every child employed in a factory shall attend school for three hours a day, and this law is strictly enforced.

Teachers of every class, public and private, have to pass two examinations. Certificates are of three degrees of merit—they may be marked 'very well qualified,' 'well qualified,' or 'sufficiently qualified.' The heads of examination are 'religion, the German language, the art of school-keeping, geography of Prussia, arithmetic and geometry, knowledge of natural objects, writing, drawing, singing, and the theory of music, organ.' After the first examination, the candidate is eligible as an assistant or provisional master; he must serve in this capacity for three years before taking the second; he must pass the second within five years. The second examination is in the same subjects; but now most weight is given to the art of school-keeping. Of the subjects taught in primary schools, the principal is religion; the others are reading, writing, arithmetic, singing, and the elements of drawing. Incidentally, the teacher may communicate information about natural phenomena; about geography, beginning with that of the locality and the history of



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Prussia. The teaching was much more ambitious before 1854; before 1854, also, the normal schools, now limited to a meagre program, were universities on a small scale, aiming at the mental training of their students, rather than at fitting them to teach elementary schools. The change is often ascribed, both in Prussia and out of it, to political motives, having been made by a party unfriendly to popular education; but eminent educationists defend and approve it. The schools, they say, are now attempting as much as can be thoroughly done in the time allotted for primary education, and are doing it thoroughly; while the showy teaching of former times, with its endeavor to develop the faculties, and to communicate knowledge, neglected the indispensable elementary instruction, and, as regarded the greater number of the scholars, was in no respect successful. The normal school training, it is said, now fits the teacher for his duties and his position in life; formerly, it rather unfitted him for them, while fitting him perhaps for something better. It is, however, admittedly a defect in the Prussian system that it offers to the humbler classes no opportunity of carrying their education beyond the point at which the elementary schools leave it. In some of the towns, there are improvement institutes, where young persons are taught in the evenings or on Sundays; but they attempt little, are badly organized, and are neglected by the school administrations. It should be stated that the town schools often teach somewhat more than is taught in country places—more geography, history, and natural knowledge—but this, though permitted, is not encouraged by the authorities. Grammar is entirely excluded from primary instruction. The only part of the teaching which is less than excellent is the writing: it has been stated that upward of 50 per cent. of the recruits are unable to write—the art, never perfectly mastered, being lost, it must be supposed, through want of practice.

As regards religious instruction, the rule is, that the primary school is denominational—public schools are set apart, that is, for children of each of the religious bodies; the clergyman who has the charge of the school is the clergyman of the body to which it is appropriated. Besides the 'Evangelical Establishment,' in which Lutherans and Calvinists are combined, there are the Rom. Catholics and the Jews to be provided for; of other sectaries, there are not 10,000 in all Prussia. The Lutherans and Calvinists are combined in the school as in the church. Dissenters are allowed to withdraw their children from the religious instruction, and have it given by their own pastor. Any commune may establish a mixed school, if it so desire, and if the authorities permit; but, in practice, mixed schools are found only where it would be very inconvenient to establish a school for each body. In mixed schools, the teachers are chosen proportionately from each of the two great religious bodies; if there be only one teacher, it is, in some districts at least, customary that he should be alternately a Protestant and a Rom. Catholic. The experiment of mixed schools had a long trial in Prussia, and was

unsatisfactory, leading to attempts, or suspected attempts, at proselytism, and to parish squabbling. It has been abandoned, not so much from the wish of the government, as in deference to the feelings of the people, and to the demands of the Rom. Cath. hierarchy. But the denominational system is more in accord with the part which the state assigns to religion in the school. The school, it is said, should be the organ of the church for training children to church-membership; school and churches are expected between them to form the child into a man contented with his position in life. Religious teaching must be given by the master for an hour every day. In the Prot. schools, the master teaches the Lutheran catechism to Lutheran children; the Heidelberg catechism to the Reformed children. Scripture history also is taught; and hymns, from a prescribed collection, have to be committed to memory. The master is not allowed to expound the catechism; his duty is to see that the children learn it, and understand the words in which it is expressed. It is the clergyman who explains the doctrines to the elder children in preparing them for confirmation.

Any one may open a private school of any class in Prussia who can obtain a license for the purpose from the government; but in a city, it must be shown that the district in which the school is to be placed is insufficiently supplied with schools; and every private teacher must have passed the two examinations. Private schools are subject at all times to the inspection of the school-councillor, and are bound strictly to follow the regulations established for private schools. The larger towns in Prussia are not yet adequately supplied with public primary schools; private primary schools are therefore common in such places; in Berlin, they educate nearly half the children who are in primary schools.

In the secondary and higher schools in Prussia, the superintendence is undertaken by the school-councillor of the province; it is independent of ecclesiastical control. The larger communes and the towns are required to maintain middle schools, giving instruction of a higher order than is given in the elementary schools, a sound German education, and preparing boys for the gymnasium. These must be provided to the satisfaction of the authorities, according to the wants of the population. They are maintained, like the primary schools, by school-fees, local taxation, and these failing, the state treasury. Some of the larger towns maintain also secondary schools of a higher class; these are of two kinds—the real school, and the gymnasium or grammar-school. In such towns, as stated already, the local management rests with the school-delegacy. There is, besides, a considerable number of real-schools and gymnasia which are entirely in the hands of the government. None of the real-schools take boarders; very few of the gymnasia do so. The gymnasium is a classical school preparing for the universities. In the real-school, mathematics, scientific studies, and modern languages are substituted for the classics, and the instruction is designed



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to prepare the pupils, as far as possible, for the pursuits of life. The real-schools grant certificates to their pupils. The royal real-schools and the gymnasia (other than those maintained by the large towns) are under the management of the provincial school-councillor. Some of the older of those gymnasia have endowments, but the money necessary for their support is contributed by the state. Appointments to the schools are made by the school-councilor; he appoints the teachers, or nominates the leet out of which local authorities have to choose, in all the secondary schools. Teachers for all the schools have to pass two examinations. There are boards of examiners, appointed by the provincial govt., which conduct the examinations; these boards also examine the students of the gymnasia, to test their fitness for the university. The university in Prussia is a teaching (or rather a lecturing), as well as an examining body, and grants degrees in four faculties— theology, jurisprudence, medicine, and philosophy. There are seven universities within the territory held by Prussia before the war of 1866; in two of these—Breslau and Bonn—there is a Rom. Cath. as well as a Prot. institute of theology. The university affairs are administered by a commissioner appointed by the crown; all their regulations are prescribed, and all the appointments in them made by the state.

### *State Education in the United States.*

In the United States, the education of the people is out of the sphere of the central or national govt.; it ranks among the domestic affairs of the several states, and it is chiefly in the Northern States—those from which, before the late war, slavery was excluded—that systematic attempts have been made to promote it. The national govt. has, however, in more than one instance endeavored to assist education in the states, by providing for it endowments. In the states which contain waste lands, it puts aside, in every newly-surveyed township of six m. square, one sq. m. ( $\frac{1}{36}$  of the whole area) for the support of schools within the township. The state becomes trustee of this land, or of the price obtained for it, which is usually called the Township Fund, and pays over the yearly income to the township when it has been settled. The national govt. about 1836, had accumulated in its treasury a considerable balance, the surplus of its income over its expenditure during several years: this it apportioned *pro ratâ* among the states, reserving the right to reclaim it. This right has not been, and is not likely to be exercised; and in most of the Northern States, the income of the 'United States Deposit Fund' is applied to the support of education. Since 1864, by what is called the 'Agricultural College Act,' the national govt. has made a liberal offer of allotments of land to the states upon certain conditions, for the endowment of one or more institutions in every state, in which—whatever the other instruction may be—special attention shall be given to branches of learning related to agriculture and

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the mechanic arts. Several states have availed, or are preparing to avail, themselves of this offer.

The progress of the Southern States since the war has been remarkable. Every state now has a complete system of common schools providing for the separate education of the white and colored children, and several of the Southern States spend more in proportion to their wealth than the Northern States. In the Northern States, besides the endowments above described—both of which are possessed by most of the states—every state possesses a school-fund arising from various sources—sale of lands, taxation, penalties, and forfeitures—which is usually vested either in the state legislature or in a board of education. In one or two of the states, the income of this fund is considerable, but in general it is small. It is usually, but not in all the states, applied solely to the support of public schools, or of the normal schools which help to provide them with teachers. Apart from the influence exercised by means of this fund, the state usually promotes public instruction only by its legislation, by which it requires or enables local bodies to make certain provision for the education of children within their jurisdiction. Everywhere, the law leaves much, and usually the practice leaves everything, to the local bodies; and these come short of, or exceed the legal requirements according to the local interest in education and ability to pay for it. It is through the interest of the municipalities in education that very ample provision is made in the towns; it is through the force of example, and in deference to educational experience, that a certain uniformity of system prevails. There is a close approach to uniformity both in the law and in the practice of the several states; and a description of the system of one state will be approximately true of that of other states. The Massachusetts system is fittest to be selected for description, as being the oldest, the most celebrated, that which in the thought of foreign countries is most identified with the common schools of America, and perhaps on the whole the most successful, though in recent years some other states point to advances which may qualify them to dispute the palm. Some of the principal variations from the Massachusetts system are noted below.

In 1642—twenty-two years after the landing of the *Mayflower*—the Massachusetts colonists passed a law requiring every citizen, under a penalty of 20s., to teach his children and apprentices, or have them taught, to read perfectly the English language. Five years later, they passed another law, requiring, under penalty, every township containing 50 householders to support a teacher to teach their children to read and write; requiring every township containing 100 householders to maintain a grammar-school capable of fitting youths for the university. The present law is different, if not less liberally conceived. The change was made by numerous steps, and was probably forced by the circumstances of the community. The law, in the revised statutes of the state, now provides that in every town-



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ship the inhabitants shall maintain for at least six months in the year a sufficient number of schools for all the children of the township. The teachers are to be of competent ability and of good morals, and they are to teach orthography, reading, writing, English grammar, geography, arithmetic, the history of the United States, and good behavior. Other subjects—algebra, vocal music, drawing, physiology, and hygiene—are to be taught or not at the discretion of the local committee. Every township may, and every township containing 500 householders must, also maintain for ten months in the year a school which shall give instruction in general history, book-keeping, surveying, geometry, natural philosophy, chemistry, botany, the Latin language, and the civil polity of Massachusetts and of the United States. And in every township containing 4,000 inhabitants, the teacher must be competent to instruct in the Greek and French languages, in astronomy, geology, rhetoric, logic, intellectual and moral sciences, and political economy. Moreover, any township may establish schools for children over 15 years of age, determining the instruction to be given, and appropriate money for their support. The compulsory part of the law is supported by penalties, but it is said that there would be difficulty in enforcing them; at any rate, they are not enforced. It is also provided that every child of between 8 and 14 years must be sent to school for at least 12 weeks in a year: the penalty for breach of this provision is 20 dollars, but the idea of enforcing it seems never to have been entertained; its existence even not generally known. The law does not permit rate-bills. There seems to be no fund arising from waste lands in Massachusetts; and the township raises the necessary funds by a tax upon property—the personal property of the inhabitants and the capitalized value of their real property situated within the township. The amount of the rate is by the law left wholly undetermined; it is determined by the householders in the annual town meeting. The state endeavors to influence the townships to make a liberal provision by means of the school-fund, a share of which is given to every township which has made its returns to the board of education, and has spent not less than at the rate of a dollar and a half per head for all the children of the township. The school-fund contribution is very small—less than a quarter-dollar for every child; but it is said to have an excellent influence upon the rural townships. No doubt, the publication of the returns made to the board of education tends to spur on the backward districts.

The management and control of all the public schools of a township are in the hands of a school-committee, consisting of any number divisible by three; the members of this committee hold office three years, and one-third of them are elected annually in the annual town meeting. The committee have the supervision of the schools; and it is among their duties to see that no book calculated to favor the tenets of any particular sect of Christians shall be used in the schools, and to require the daily reading of some

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portion of the Bible in the common English version. Any township, by its town meeting, or a city, by its city-council, may require the committee to appoint a paid supt. of schools; when this is not done, the members of the committee receive a small allowance for the time during which they are engaged upon the school-affairs. But, moreover, any township may, at a meeting called for the purpose, resolve to divide itself into districts for the support of its schools. If this be done, the township names for each district a 'prudential committee,' consisting either of one or of three persons, resident within the district, which is charged with providing and keeping in repair the school-house, at the expense of the district. and, if the township so determines, with the duty of selecting and contracting with the teachers. The district determines the amount to be raised by it for the building, or repair or furnishing of its school; this is collected by the township collector, and handed over to the district-committee. The school committee retains its functions of management, except so far as they have been made over to the districts; and hence, there is a double management of the schools, which is found to have some inconveniences. The division into districts, too, is said to have led to an unnecessary multiplication of schools in country places; people scheme to have the township so divided that there may be a school in their neighborhood—there are therefore in some places more schools than are needed, and more than can be maintained in efficiency. The school-committee—in cities, the school-supt.—examines the teacher before his appointment, and grants him a certificate, which remains in force for a certain time. There are three classes of certificate—one valid for six months, another for twelve, a third for two years. The common schools of a township are open to all children resident therein between five and fifteen years of age; none are to be excluded on account of race, color, or religious opinions; and it has been held that a child unlawfully excluded may recover damages therefor in an action of tort.

In N. Y., in Penn., and in most of the Western States, large municipal powers are possessed by the county, and the county shares with the township the management of school-affairs. N. Y. has a state supt., whose power over the schools is considerable. In that state, it is the school-commissioner of the 'Assembly District' in which the township lies who divides the township into school-districts; and it is the district which determines the school-tax: the township, so prominent in New England from earliest times as the source or unit of governmental authority, is almost completely ignored. By law in O., and Ill., it is by county officials that teachers are examined and certificated. In N. Y., R. I., and Conn., 'rate-bills'—that is, school-fees—are allowed, and are usually levied. Several states besides Mass. make school-attendance compulsory: in most of the states, there appears to be some provision against 'truancy;' but it is understood that attempts are not made to enforce the law except occasionally, in the case of homeless,



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wandering children, who are liable, in lieu of a fine, to be sent to reformatory schools.

As might be expected, the school-laws work poorly in some country districts. The householders are disposed to be satisfied with any kind of school, provided it be cheap, and located within easy reach; and the multiplication of schools by the district-system, makes it almost unavoidable that an insufficient sum should be spent upon each school. In many such districts, the teachers—a vast majority of whom are women—being insufficiently paid, are not well qualified; they are constantly changing; scarcely any intend to make teaching their occupation for life. Few of them have been trained for their work—the normal schools which exist being utterly inadequate to supply the demand for teachers; and the examination by a rural school-committee affords but a slender guarantee of competency. The teacher is usually ‘boarded round’ among the farmers of the rural district, and is said to be treated by them with much observance; but his income—putting a money-value upon the board—was estimated some years ago at an average of about \$13.00 a month, and that only during the time that the school is open. In recent years, however, salaries have been considerably increased. In 1864, in 84 townships of Mass.—more than a fourth of all the townships in the state—the schools were kept open for less than the statutory period of six months. In those schools the teaching is said to be wonderfully good, considering the scanty pay given; but where the vacations last more than six months, and the teacher is changed almost every term, thorough and systematic instruction is scarcely possible. It is in the towns that the working of the school-law has been highly creditable and successful. Through the high public spirit of the municipal bodies, and the great importance attached to education, the support of the common schools is in general most liberally provided for.

In the towns, there is usually a supt. of schools, by whom, under and in co-operation with the general and district school-committees, the schools are inspected, and the character of the instruction determined; by him the examination of the teachers also is conducted. Of the schools, there are four classes—primary, intermediate, grammar, and high-schools or academies. Children usually enter the primary school at the age of about 5 or 6 years; the grammar-school between 8 and 9; the high-school between 12 and 13 years. They are not promoted from one class of school to another without undergoing an examination; the intermediate schools, where they exist, are intended for those who are too old to be at the primary school, and too backward to enter the grammar-school. To be admitted to a grammar-school, a child must be able to read at first sight easy prose, to spell common words of not more than three syllables, and to have acquired a slight knowledge of arithmetic. For admission to the high-school, the usual requirements are ability to read correctly and fluently, an acquaintance with the simple rules of arithmetic, and some knowledge of geography and grammar. From these tests

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may be inferred the average proficiency expected to be attained by children leaving the primary and the grammar school respectively. In the grammar-schools of Boston, the programme of studies consists of spelling, reading, writing, arithmetic with book-keeping, geography, English grammar, the history of the United States, natural philosophy, drawing, and vocal music: this is nearly the usual programme; but in New York and one or two other states a little more is attempted. Between the high-schools or academies in the various states, there are considerable differences. In the city of New York, for example, the Free Academy has pretensions to the rank of a university, and grants degrees in arts and science (bachelor of arts, bachelor of science, master of arts) to students who have completed with credit the curriculum of five years. But, in general, the high-schools are schools of secondary instruction, intended to prepare youths for the university—instruction being given in the classical languages, mathematics, the sciences, history, and the English language and English literature. The usual curriculum is one of four years; and the students are not required to study all the subjects taught in the school. At Boston, where boys are admissible to the Latin high-school at 10 years of age, the curriculum lasts six years. There are high-schools for girls as well as for boys, the programme of instruction being the same in both. At Boston, the curriculum at the girls' high-school lasts three years; and pupils at admission must be 15-19 years of age. Boston possesses, besides its Latin high-school and its girls' high-school, an English high-school, admirably planned and conducted. The instruction in it closely resembles that given in the real-schools of Germany, including French and German, and various sciences, with their application; being intended to enable boys to complete a sound English education, and to prepare themselves for commercial life. Great complaints are almost everywhere made—Boston seems to be exceptional in this respect—of the irregularity of the attendance at the primary schools. It is estimated that in most states not much more than half of the children pass from these to the grammar-schools; only a small proportion of the grammar-school pupils enter the high-schools, and of these, only a small fraction persist to the end of the curriculum. All high-schools grant certificates of graduation to pupils who have creditably gone through the course of study. The study of the classics does not, even in the most pretentious institutions of this class, seem to be carried very far, much more attention being given to mathematics and natural science. The number of students who complete the five years' curriculum of the New York Free Academy seldom exceeds 50. Among the wealthy, in some regions of the country, there is said to be a growing disinclination to make use of the common-schools: their children are usually sent to private academies, which are very numerous and often of high grade of excellence. The only serious opposition to the non-religious character of the common-schools comes from the Rom. Cath. clergy; though there



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is a growing feeling upon this subject among some of the other religious bodies. In many of the New York city schools, in which the majority of the children are Rom. Cath., clerical influence, insufficient to impress upon the education the religious character which it would approve, has obtained, with the tacit assent of the school-authorities, the disuse of the daily Bible reading which the law prescribes. There is now a wide movement on the part of the Rom. Cath. Church, to gain an assignment of a share of the public-school money for their own use, or to gain a distinct share in the management of a certain proportion of the schools. In case of refusal of this, they are proceeding in various places to establish parochial schools as substitutes for the governmental common-schools. This presents a grave problem—the gravest at present—in the school system in the United States, and is now exciting close attention and earnest debate.

The primary and grammar schools are most frequently mixed schools—that is, they admit boys and girls; in the teaching, however, the sexes are kept apart. The teachers in primary and grammar schools, even in the towns, are usually women; but in Boston the principal of a grammar-school is always a man. The schools are in towns always *graded*—divided into classes composed of those who are at the same stage; each grade forms a separate dept. of the school, and is taught by a separate master. The usual number of pupils allotted to a teacher is in the primary schools about 50; in the grammar-schools about 35. This system of grading is a cheap system, because it enables a teacher to take charge of a large number of pupils; but it is said to lead to a want of thoroughness in the instruction, the teaching being addressed to the class rather than to the individual members of it. Want of thoroughness seems to foreign critics, indeed, the besetting sin of American teaching, which is thought to aim too much at communicating knowledge, not sufficiently at developing capacities. In the primary and grammar schools, the education costs from \$6-\$8 per head; in the high-schools, from \$30-\$50 per head.

### *Statistics of National Education.*

The proportion of children attending school—i.e., enrolled in school-registers—to the whole population of the countries under mentioned was approximately stated some years ago as follows: United States (Northern) 1 in 4·5; England, 1 in 7·7; Scotland, 1 in 6·5; Prussia, 1 in 6·27; France, 1 in 9; Holland, 1 in 8·11; Belgium, 1 in 11; Switzerland, 1 in 7; the minor Protestant states of Germany, 1 in 6·7. These figures, however, must not be taken as indicating the comparative diffusion of education in the countries named: nor are they to be relied on as indicating, with anything like exactness, the comparative proportions of children actually attending school; for the proportion of the children enrolled which on the average is in actual attendance, varies in different countries. It should also be borne in mind that averages conceal the condition of the

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worst parts of a country: in Scotland, for instance, where the school attendance varies from 1 in 4 of the population in the best districts, to 1 in 15, 1 in 20, and even to 1 in 30 in the worst.

See the Reports of the U. S. Bureau of Education, and U. S. Commissioner of Education; Fraser's Report on American (U. S. and Canada) Schools; Reports of the assistant-commissioners appointed to inquire into the State of Popular Education in England, vol. IV., being vol. XXI. part iv. sess. 1861; the second Report of the Scottish Educational Commissioners, 1867; the Statistical Society's Quarterly Journal, 1867, March; Horace Mann on Education in European Countries; Cousin on German and Dutch Education; M. Block's Abstract of Public Documents relating to Education in France; *L'Instruction du Peuple*, par Pierre Tempels (Bruxelles, 1865); *Statistische Nachrichten über das Elementar Schulwesen*, an official return, which gives a complete survey of elementary education in Prussia to the end of 1864, *Congrès International de Bienfaisance de Londres, Session de 1862*; and *Rapport et Discussion sur l'Instruction Obligatoire*.

See statistical tables on pages following: also UNITED STATES, *Education*.



# EDUCATION.

## STATISTICS OF ELEMENTARY EDUCATION IN EUROPE AND AMERICA.

Countries.	Date of rep't.	Popula- tion.	Children enrolled in school.	Ratio to pop. <i>per ct.</i>	Cost per capita of pop.	Pay tuition or not.
Argentine Repub <sup>c</sup>	1890	4,086,492	276,983	6.8	<i>d</i> \$2.55	Free.
Austria-Hungary..	1889	41,231,342	5,312,656	12.9	—	—
Austria.....	1889	23,895,413	3,132,088	13.1	*.22	Both.
Hungary.....	1889	17,335,929	2,180,568	12.6	.42	Do.
Belgium.....	1890	6,147,041	827,958	13.5	1.60	Do.
Bolivia.....	1890	1,192,162	27,764	2.3	*.03	Free.
Brazil.....	1889	14,002,335	305,103	2.2	1.51	Do.
Bulgaria (and Rou- melia).....	1890	3,154,375	171,983	5.5	*.12	Free.
Canada.....	1889	4,829,411	998,823	20.8	1.85	Do.
Chili.....	1888	2,766,747	122,664	4.4	(?)	Do.
Colombia.....	1889	3,878,600	93,187	2.4	(?)	Do.
Costa Rica.....	1890	238,782	17,500	7.3	1.55	Do.
Cuba.....	1887	1,521,684	<i>a</i> 50,000	3.3	(?)	—
Denmark.....	1885	2,185,159	239,940	11.0	1.54	Both.
Ecuador.....	1890	1,271,861	58,308	4.6	(?)	Free.
France.....	1889	38,343,192	5,807,157	15.1	1.34	Do.
Germany.....	<i>a</i> 1890	49,421,064	9,300,000	18.8	—	—
Prussia.....	<i>a</i> 1890	29,959,388	5,874,390	19.6	1.86	Both.
Bavaria.....	1890	5,589,382	1,187,792	21.2	—	Do.
Saxony.....	1889	3,500,513	706,946	20.2	2.28	Free.
Württemberg....	1889	2,035,443	388,262	19.0	1.67	Both. <sup>b</sup>
Baden.....	1889	1,656,817	342,764	20.6	—	Do.
Great Britain & Ire.	1890	37,888,153	6,184,858	16.3	—	—
England & Wales	1890	29,001,018	4,825,560	16.6	1.30	Both.
Scotland.....	1890	4,033,103	664,466	16.4	1.40	Free.
Ireland.....	1890	4,706,162	694,832	14.7	1.05	Both. <sup>c</sup>
Greece.....	1884	2,187,208	140,155	6.4	—	—
Guatemala.....	1890	1,452,003	57,380	4.0	.37	Free.
Guiana (British)...	1890	284,887	27,884	9.8	.44	Both.
Guiana (French)...	1888	25,796	1,658	6.4	(?)	—
Haiti.....	1890	960,000	<i>a</i> 10,000	1.0	(?) •	Free.
Honduras.....	1890	463,388	<i>a</i> 25,450	5.4	(?)	—
Italy.....	1889	30,158,408	2,733,859	9.6	.79	Both.
Jamaica.....	1890	639,491	75,680	11.8	*.21	Do.
Mexico.....	1888	11,632,924	543,977	4.7	.32	Free.
Montenegro.....	1889	236,000	3,300	1.4	—	Do.
Netherlands (The).	1890	4,564,565	657,611	14.2	1.42	Both. <sup>b</sup>
Nicaragua.....	1887	400,000	11,914	3.0	(?)	—
Norway.....	1888	1,999,176	308,507	15.4	.80	Both.
Paraguay.....	1891	329,645	25,594	8.0	.99	Free.
Peru.....	1890	2,700,945	71,435	2.6	.11	Both.
Porto Rico.....	—	806,708	—	—	(?)	—
Portugal.....	1887	4,708,178	276,688	5.9	*.25	Both.
Roumania.....	1890	5,500,000	138,800	2.5	*.20	Free.
Russia.....	1890	95,870,810	<i>a</i> 3,000,000	3.1	*.13	Both.
Finland.....	1890	2,305,916	406,966	17.6	*.50	Do.
Salvador.....	1889	777,895	28,473	3.7	(?)	—
Santo Domingo...	1890	610,000	<i>a</i> 10,000	1.6	(?)	Free.
Servia.....	1889	2,162,759	58,575	2.7	*.23	Do.
Spain.....	1885	17,550,246	1,859,183	10.6	*.21	Both.
Sweden.....	1890	4,784,675	736,790	15.4	.70	Do.
Switzerland.....	1890	2,917,740	570,935	19.5	2.03	Free.
Turkey.....	1882	4,786,545	126,471	2.6	—	Fee.
United States.....	1890	62,622,250	14,377,536	23.3	2.24	Free.
Uruguay.....	1888	683,943	54,513	8.0	.75	Both.
Venezuela.....	1891	2,285,054	104,840	5.0	*.16	Free.

\*From state only.

*a* Estimated.

*b* Amount of tuition paid in Würtemberg, \$1 to \$1.50 per annum.  
Amount of tuition paid in the Netherlands varies between \$3, \$8,  
and \$24 per annum.

*c* The bill for the remission of fees in Ireland was not passed till  
1892. In England and Wales the corresponding bill did not go into  
effect until September, 1891.

*d* Depreciated paper money.

# EDUCATION.

## PUBLIC SCHOOL STATISTICS OF THE U. S. IN 1891-2.

States and Territories.	Days per year.	Children 5-18 years of age.	Enrolled in public schools.	Average daily attendance.	Teachers employed.	Value of school property.
Alabama...	73.5	540,226	301,615	192,467	6,608	\$1,120,000
Arizona....	172.0	17,100	10,080	6,080	269	361,600
Arkansas...	74.0	419,900	251,452	140,445	5,641	1,485,071
California..	159.0	300,000	238,106	158,875	5,891	15,193,996
Colorado...	150.1	101,200	76,647	47,946	2,753	5,441,908
Conn.....	182.3	181,700	130,971	84,887	4,252	7,237,001
Delaware...	166.0	47,491	31,434	19,649	732	836,749
D. C.....	185.0	65,600	39,678	29,762	845	2,713,000
Florida....	120.0	140,100	93,780	62,226	2,782	637,056
Georgia....	100.0	672,700	397,815	234,231	8,114	2,310,000
Idaho.....	86.4	27,700	17,360	11,020	558	686,000
Illinois....	155.4	1,136,000	809,452	574,738	22,346	30,679,868
Indiana....	132.0	652,800	511,823	366,364	13,549	16,777,504
Iowa.....	158.0	589,500	509,830	321,708	27,253	13,800,152
Kansas....	127.0	441,300	382,225	239,299	11,888	10,703,708
Kentucky...	100.0	627,700	389,860	243,192	9,502	4,094,504
Louisiana..	104.4	294,300	140,233	96,475	3,185	680,000
Maine.....	123.0	161,800	136,634	90,191	7,686	3,803,970
Maryland...	184.0	312,000	189,129	105,063	4,051	5,230,000
Mass.....	171.0	528,400	383,217	283,648	10,965	28,500,000
Michigan...	156.0	599,000	417,467	296,671	16,100	15,248,703
Minnesota..	155.2	402,700	300,333	141,472	9,265	10,728,633
Mississippi	95.0	485,700	340,927	197,275	7,922	1,400,490
Missouri...	122.3	869,400	640,799	433,951	14,345	13,774,860
Montana...	148.0	29,250	21,768	14,940	754	1,569,356
Nebraska...	135.0	342,400	253,909	154,402	9,085	8,058,627
Nevada....	154.4	9,675	7,161	5,152	259	292,214
N. H.....	121.6	85,300	61,271	43,508	3,104	2,960,692
N. J.....	190.0	405,222	243,254	150,569	4,781	10,004,236
N. Mex.....	90.0	45,030	21,297	16,760	601	195,000
N. Y.....	185.0	1,481,000	1,073,093	665,574	32,161	47,064,407
N. C.....	62.4	583,300	335,358	198,747	6,950	892,364
N. D.....	117.0	52,080	37,916	21,413	2,238	2,423,286
Ohio.....	165.5	1,054,000	800,356	563,481	25,620	34,527,816
Oklahoma...		30,420	13,205	7,510	472	66,196
Oregon.....	112.8	94,980	75,526	52,724	2,694	2,494,234
Penn.....	155.4	1,529,000	1,032,113	708,719	25,339	40,603,614
R. I.....	188.0	89,470	52,737	37,001	1,432	3,271,186
S. C.....	73.4	440,100	205,619	148,761	4,398	485,534
S. D.....	100.7	98,300	71,070	45,870	4,128	2,562,600
Tennessee...	96.0	625,500	487,507	349,483	8,612	3,211,000
Texas.....	105.9	811,200	528,314	336,257	11,021	5,439,618
Utah.....	153.0	76,760	55,448	31,632	933	1,457,966
Vermont...	138.0	80,410	65,314	45,057	4,351	1,298,005
Virginia...	118.0	580,800	335,646	186,026	7,793	2,763,637
Wash.....	106.6	95,830	78,819	50,716	2,763	4,088,645
W. Va.....	110.0	266,200	200,789	128,044	5,747	2,741,234
Wisconsin...	158.6	526,300	362,064	217,200	12,355	10,224,926
Wyoming...	120.0	16,050	9,426	6,110	367	316,000
Totals....	137.1	19,192,894	13,205,877	8,547,551	374,460	\$382,457,167

### PER CENT. OF THE SCHOOL POPULATION ENROLLED.

Years.	United States.	North Atlantic Division.	South Atlantic Division.	South Central Division.	North Central Division.	Western Division.
1870-71	61.45	77.95	30.51	34.17	76.87	54.77
1875-76	64.70	78.55	46.72	37.36	77.05	66.37
1880-81	65.03	74.28	51.49	47.03	74.59	64.82
1885-86	68.14	72.63	57.68	56.82	76.08	68.03
1889-90	68.61	70.45	59.22	60.14	76.46	70.01
1890-91	69.03	69.85	59.80	62.51	76.00	73.28
1891-92	68.82	69.97	58.84	61.87	75.84	75.55



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RECEIPTS, EXPENDITURES, ETC., OF PUBLIC SCHOOLS IN THE UNITED STATES 1891-2.

States and Territories.	Receipts.*	Yearly expenditures.		Salaries of teachers & supts.	Monthly average of salaries.	
		Total.†	Per pupil.		Male.	F'm'e
Alabama ....	\$899,782	\$890,000	\$4.88	\$660,000	\$ —	\$ —
Arizona .....	172,050	204,000	33.55	136,000	85.82	73.15
Arkansas ....	1,096,270	1,159,653	8.26	987,151	36.27	32.80
California....	5,499,209	5,434,216	34.20	3,956,672	82.96	66.12
Colorado ....	2,323,754	1,981,635	41.34	985,137	64.70	53.51
Connecticut..	2,266,182	2,269,260	26.74	1,461,427	83.69	39.48
Delaware....	275,000	275,000	13.99	225,000	36.60	34.08
D. C. ....	961,070	964,070	32.39	586,386	110.70	68.40
Florida .....	638,710	537,236	8.63	450,100	—	—
Georgia .....	1,458,266	1,447,245	6.18	1,303,682	—	—
Idaho .....	282,449	232,278	21.08	162,731	—	—
Illinois .....	13,252,867	13,121,708	22.83	8,105,877	56.92	46.06
Indiana .....	5,609,655	5,609,655	15.56	3,835,919	46.00	40.20
Iowa .....	7,410,131	7,056,222	21.93	4,589,236	37.76	30.78
Kansas .....	4,212,897	4,346,767	18.16	3,060,457	42.15	35.42
Kentucky....	2,428,752	2,490,712	10.24	2,007,083	37.72	28.86
Louisiana....	963,779	1,004,741	10.41	656,342	35.03	31.61
Maine .....	1,423,671	1,393,833	15.46	857,244	43.95	25.02
Maryland....	1,921,428	2,149,972	20.46	1,618,829	49.80	40.04
Mass. ....	9,315,556	9,315,557	32.83	5,400,724	134.22	46.52
Michigan....	5,741,524	5,746,161	19.37	3,589,464	47.72	34.15
Minnesota....	4,518,316	4,384,413	30.98	2,776,787	48.28	34.58
Mississippi...	1,249,437	1,266,865	6.42	1,071,615	30.05	27.23
Missouri.....	5,649,356	5,792,032	13.34	3,846,963	45.28	40.72
Montana .....	551,700	679,394	45.47	316,822	—	—
Nebraska ....	3,505,886	3,524,151	22.82	2,258,970	45.20	39.20
Nevada .....	200,105	185,223	35.96	151,691	103.38	64.79
N. H. ....	835,713	850,886	19.55	561,441	48.02	26.09
N. J. ....	3,769,317	3,966,879	26.35	2,469,177	77.25	43.54
N. Mex. ....	184,582	205,100	12.27	123,395	—	—
N. Y. ....	18,206,527	18,365,562	27.59	11,808,167	66.11	47.32
N. C. ....	800,450	760,991	3.83	602,939	25.21	21.80
N. D. ....	834,475	803,253	37.51	421,918	43.31	34.26
Ohio .....	11,102,902	11,839,998	21.01	7,438,067	42.19	35.69
Oklahoma....	55,189	71,755	9.55	48,255	34.20	32.90
Oregon .....	1,198,077	1,102,832	20.92	693,789	50.04	41.91
Penn. ....	15,611,642	14,329,140	20.22	7,766,657	42.15	31.41
R. I. ....	1,363,048	1,267,369	34.27	659,929	93.23	49.38
S. C. ....	519,912	483,698	3.25	432,076	28.05	23.92
S. D. ....	1,617,211	1,380,727	30.10	686,427	—	—
Tennessee..	1,925,340	1,687,058	4.83	1,383,905	32.83	27.82
Texas .....	3,845,511	3,799,459	11.30	3,094,033	53.25	45.10
Utah .....	750,413	911,010	28.79	412,921	68.13	42.95
Vermont ....	727,782	738,058	16.38	558,719	38.40	24.80
Virginia .....	1,689,818	1,600,465	9.09	1,356,513	31.93	26.86
Washington..	1,389,792	2,391,093	47.15	882,450	52.17	45.78
W. Va. ....	1,510,094	1,408,065	11.00	885,731	—	—
Wisconsin...	4,793,599	4,259,321	19.61	2,863,532	50.36	32.28
Wyoming....	216,555	216,555	35.45	124,721	—	—
Totals .....	\$156,778,751	\$155,991,273	\$18.25	\$100,333,071	\$45.48	\$37.56

\*Excluding sales of bonds and balance on hand.

†Excluding payment of bonded debt.

# EDUCATION.

COMPARATIVE STATISTICS OF ILLITERACY IN THE U. S. IN 1880 AND 1890.

STATES AND TERRITORIES.	Pop. 10 years old and upward, 1880.			Pop. 10 years old and upward, 1890.			White illiterates, 1890.		Col'd pop. 10 years old and upward, 1890.	
	Total.	Illiterates	Per cent.	Total.	Illiterates	Per cent.	Native.	Foreign-born.	Total.	Illiterates
Alabama.....	851,780	433,447	50.9	1,069,545	438,535	41.0	106,235	1,100	479,430	331,200
Arizona.....	32,922	5,842	17.7	46,076	10,785	23.4	2,056	6,900	3,594	1,829
Arkansas.....	531,876	202,015	38.0	787,113	209,745	26.6	92,052	1,038	217,454	116,655
California.....	681,062	53,430	7.8	989,896	75,902	7.7	10,113	30,120	90,737	35,669
Colorado.....	158,220	10,474	6.6	327,896	17,180	5.2	9,235	6,239	6,837	1,706
Connecticut.....	497,303	28,424	5.7	609,830	32,194	5.3	4,300	26,236	10,484	1,658
Delaware.....	110,856	19,414	17.5	131,967	18,878	14.3	6,068	2,118	21,608	10,692
District of Columbia.....	136,907	25,778	18.8	188,567	24,881	13.2	1,803	1,692	61,041	21,389
Florida.....	184,650	80,183	43.4	283,250	78,720	27.8	16,685	1,831	119,034	60,204
Georgia.....	1,043,840	520,416	49.9	1,302,208	518,706	39.8	113,945	746	600,623	404,015
Idaho.....	25,005	1,778	7.1	62,721	3,225	5.1	867	1,252	2,275	1,106
Illinois.....	2,269,315	145,397	6.4	2,907,671	152,634	5.2	64,380	75,839	46,000	12,415
Indiana.....	1,468,095	110,761	7.5	1,674,028	105,829	6.3	78,638	15,696	35,694	11,495
Iowa.....	1,181,641	46,609	3.9	1,441,308	52,061	3.6	20,649	29,179	8,459	2,233
Kansas.....	704,297	39,476	5.6	1,055,215	42,079	4.0	17,157	12,562	38,037	12,360
Kentucky.....	1,163,498	348,392	29.9	1,360,031	294,381	21.6	178,159	5,692	197,689	110,530
Louisiana.....	649,070	318,380	49.1	794,683	364,184	45.8	72,013	8,926	392,642	283,245
Maine.....	519,669	22,170	4.3	541,662	29,587	5.5	11,443	17,665	1,505	479
Maryland.....	695,364	134,488	19.3	798,605	125,376	15.7	32,105	12,548	161,106	80,723
Massachusetts.....	1,432,183	92,980	6.5	1,830,607	114,468	6.2	9,727	101,715	19,595	3,026
Michigan.....	1,236,686	63,723	5.2	1,619,035	95,914	5.9	27,016	61,060	16,561	4,838
Minnesota.....	559,977	34,546	6.2	962,350	58,057	6.0	7,112	49,854	4,688	1,091
Mississippi.....	753,693	373,201	49.5	902,028	360,613	40.0	44,987	768	516,929	314,858
Missouri.....	1,557,631	208,754	13.4	1,995,638	181,368	9.1	112,938	20,868	114,160	47,562
Montana.....	31,989	1,707	5.3	107,811	5,884	5.5	1,020	3,212	4,547	1,652
Nebraska.....	318,271	11,528	3.6	771,650	24,021	3.1	7,412	14,163	9,515	2,446



## EDUCATION.

STATES AND TERRITORIES.	Pop. 10 years old and upward, 1880.			Pop. 10 years old and upward, 1890.			White illiterates, 1890.		Col'd pop. 10 years old and upward, 1890.
	Total.	Illiterates	Per cent	Total.	Illiterates	Per cent	Native.	Foreign-born.	
Nevada.....	50,666	4,069	8.0	38,225	4,897	12.8	173	1,183	5,936
New Hampshire.....	286,188	14,302	5.0	315,497	21,476	6.8	3,679	17,661	584
New Jersey.....	865,591	53,240	6.2	1,143,123	74,321	6.5	21,351	41,812	39,237
New Mexico.....	87,966	57,156	65.0	112,541	50,070	44.5	40,065	3,200	8,438
New York.....	3,981,428	219,600	5.5	4,822,392	266,911	5.5	57,362	198,136	62,110
North Carolina.....	959,951	463,975	48.3	1,147,440	409,703	35.7	173,545	177	392,589
North Dakota*	99,849	4,821	4.8	129,452	7,743	6.0	929	6,590	454
Ohio.....	2,299,367	131,847	5.5	2,858,659	149,843	5.2	82,673	49,571	69,180
Oklahoma.....				44,701	2,400	5.4	1,342	161	2,290
Oregon.....	130,565	7,423	5.7	244,374	10,103	4.1	3,302	3,644	11,449
Pennsylvania.....	3,203,215	228,014	7.1	4,063,134	275,353	6.8	110,737	143,926	89,125
Rhode Island.....	220,461	24,793	11.2	281,959	27,525	9.8	4,087	22,268	6,330
South Carolina.....	667,456	369,848	55.4	802,406	360,705	45.0	50,063	350	470,232
South Dakota.....				236,208	9,974	4.2	1,811	7,753	1,429
Tennessee.....	1,062,130	410,722	38.7	1,276,631	340,140	26.6	170,318	1,851	309,300
Texas.....	1,064,196	316,432	29.7	1,564,755	308,873	19.7	89,829	42,560	356,154
Utah.....	97,194	8,826	9.1	147,227	8,232	5.6	2,211	5,188	1,790
Vermont.....	264,052	15,837	6.0	271,173	18,154	6.7	7,219	10,775	788
Virginia.....	1,059,034	430,352	40.6	1,211,934	365,736	30.2	103,265	1,793	455,682
Washington.....	55,720	3,889	7.0	275,639	11,778	4.3	2,467	5,794	7,892
West Virginia.....	428,587	85,376	19.9	549,538	79,180	14.4	65,420	2,768	24,737
Wisconsin.....	965,712	55,558	5.8	1,258,390	84,745	6.7	15,613	67,371	4,796
Wyoming.....	16,479	556	3.4	47,755	1,630	3.4	427	981	1,319
Totals.....	36,761,607	6,239,958	17.0	47,413,559	6,324,702	13.3	2,065,003	1,147,571	5,482,485
									5,112,128

\*Dakota Territory.

# EDUCATION.

COLLEGES AND UNIVERSITIES IN THE UNITED STATES IN 1892-3.

States and Territories.	Institutions.	Instructors.	Students.	Volumes in libraries.	Value of grounds and build- ings.	Value of scientific apparatus.	Productive funds.	Total income.
Alabama.....	7	69	1,283	27,600	\$704,500	\$98,360	\$353,000	\$102,114
Arizona.....	1	10	38		66,700	26,475		30,190
Arkansas.....	5	46	1,111	9,300	255,000	12,500	15,500	27,530
California.....	14	385	4,228	138,450	7,583,900	629,600	2,523,128	679,553
Colorado.....	4	152	1,095	22,500	586,300	62,800	387,728	122,830
Connecticut.....	3	232	2,379	275,000	4,640,000	767,200	5,501,912	726,458
Delaware.....	1	13	90	6,007	80,000	35,000	83,000	21,488
District of Columbia.....	4	294	2,164	92,782	2,900,000	150,000	425,000	226,557
Florida.....	4	43	572	7,900	261,000	10,000	146,000	25,401
Georgia.....	8	106	2,042	45,800	1,156,750	109,056	919,798	114,937
Idaho.....	1	6	135	1,585	40,000	4,498		49,513
Illinois.....	28	809	11,546	434,584	5,996,700	572,893	5,743,239	1,037,253
Indiana.....	15	334	4,439	180,900	2,335,304	447,144	2,044,368	438,256
Iowa.....	24	446	7,594	126,151	2,270,341	213,500	1,473,291	377,505
Kansas.....	17	271	5,086	79,900	1,602,000	299,300	563,000	222,997
Kentucky.....	13	157	3,602	50,713	1,072,000	64,000	1,166,233	137,185
Louisiana.....	9	213	3,100	116,800	1,437,255	103,673	1,701,814	246,240
Maine.....	3	50	668	91,803	678,936	114,397	1,332,933	102,207
Maryland.....	10	201	2,184	144,520	1,762,000	230,700	3,043,500	358,070
Massachusetts.....	9	353	5,789	643,650	7,062,500	1,353,263	13,652,923	1,404,003
Michigan.....	12	312	6,434	172,734	1,792,415	671,306	1,685,731	528,581
Minnesota.....	12	278	3,531	72,525	2,853,232	183,378	1,634,554	293,411
Mississippi.....	5	58	986	23,000	545,000	67,300	708,000	66,327
Missouri.....	29	534	7,576	146,503	3,931,700	186,000	2,797,929	535,934
Montana.....	1	8	84	1,200	50,000	7,000		7,500
Nebraska.....	9	219	2,560	41,559	1,988,650	203,400	434,777	214,466



## EDUCATION.

States and Territories.	Institutions.	Instructors.	Students.	Volumes in libraries.	Value of grounds and build- ings.	Value of scientific apparatus.	Productive funds.	Total income.
New Hampshire.....	1	50	458	73,500	\$250,000	\$100,000	\$1,100,000	\$96,000
New Jersey.....	5	140	1,802	137,926	1,980,000	565,800	2,700,000	253,870
New Mexico.....	1	7	108	500	35,000	750		12,500
New York.....	23	966	11,114	678,195	11,859,587	2,307,416	21,528,434	2,129,264
North Carolina.....	11	164	2,300	64,906	1,110,000	113,000	521,026	147,252
North Dakota.....	4	44	517	7,740	290,000	37,500	25,000	52,950
Ohio.....	38	856	12,854	320,837	6,133,304	877,389	6,525,165	868,545
Oklahoma.....	1	6	121	600	45,000	300		5,667
Oregon.....	6	123	1,112	17,730	455,000	22,600	328,000	82,011
Pennsylvania.....	31	743	9,076	415,138	8,022,737	1,116,640	5,224,588	933,745
Rhode Island.....	1	58	549	80,000	1,250,000	538,200	1,130,369	132,529
South Carolina.....	9	107	1,713	59,200	776,000	8,100	252,000	131,893
South Dakota.....	6	85	1,130	11,525	372,650	22,025	85,000	54,695
Tennessee.....	23	424	6,159	130,344	3,140,870	297,556	2,162,000	374,298
Texas.....	11	165	3,513	27,438	1,125,000	72,900	737,000	165,998
Utah.....	1	17	368	10,500	280,000	30,000		46,543
Vermont.....	2	55	499	65,461	450,000	135,000	630,000	83,521
Virginia.....	8	137	1,759	137,000	1,694,000	344,900	1,775,816	279,885
Washington.....	5	40	630	10,232	529,000	15,300	4,000	44,900
West Virginia.....	4	38	613	9,446	345,000	20,200	114,640	102,712
Wisconsin.....	10	192	3,148	101,900	2,159,000	263,500	1,318,500	387,575
Wyoming.....	1	14	108	2,650	100,000	2,500		59,174
Totals.....	451	10,247	140,033	5,319,602	\$95,545,618	\$13,532,419	\$94,500,758	\$14,601,034

## EDUCE—EDUR.

Of colleges for women (1900-1) there were reported 13 with 263 male, 324 female instructors (587), 5,496 students, 409 scholarships, 19 fellowships, 210,158 volumes in the libraries, scientific apparatus valued at \$6,948,106, productive funds aggregating \$5,142,170; total income \$1,643,959; and benefactions, \$591,225. There were 6,318 public high schools, with 21,778 instructors and 541,730 pupils; and 1,892 private academies, etc., with 9,775 instructors and 108,221 pupils.

The colored population of school age was 2,734,233, of whom 1,564,526 were enrolled in the public schools, and 977,192 were in average daily attendance. For advanced instruction there were reported (1900-1) 138 secondary and higher schools for negroes, with 1,781 teachers and 39,419 students, 250,524 vol. in libraries, valued at \$238,798; grounds, buildings and libraries, valued at \$238,798; grounds, buildings and scientific apparatus valued at \$7,624,520; benefactions aggregating \$505,244; productive funds \$163,297. In 138 schools there were 17,138 students in all the grades receiving industrial training; 2,294 in farm and garden work; 2,279 in carpentry, 236 in blacksmithing; 34 in plastering, 131 in painting, and 10,265 in other branches.

The total number of pupils in the common schools (1900-1) was 15,603,451; teachers, 430,004; total expenditure for the public schools, \$226,043,236, of which \$142,776,168 was for teachers' salaries. Grand total of pupils enrolled in pub. and pri. institutions, 17,299,230.

**EDUCE**, *v.* *ě-dūs'* [*L. educĕrĕ*, to bring up, to rear—from *e*, out of; *dūcō*, I lead; *ductus*, led]: to bring or draw out; to bring to light; to elicit; to develop. **EDUC'ING**, *imp. -sing.* **EDUCED'**, *pp. -dūst'*. **EDUCT**, *n.* *ě'dūkt*, that which is brought to light by separation or analysis: the term is employed in *chemistry* to indicate that the body to which it is applied is separated by the decomposition of another in which it previously existed as such. It thus stands in opposition to *product*, which denotes a compound not previously existing, but formed during decomposition. Thus, the volatile oils which pre-exist in cells in the fruit and other parts of plants, and oil of sweet almonds obtained by pressure, are educts; while oil of bitter almonds, which does not preëxist in the almond, but is formed by the action of emulsine and water on amygdaline, is a product. **EDUC'TION**, *n.* *-dūk'shŭn* [*F.—L.*]: the act of educating or bringing into view. **EDUC'TOR**, *n.* *-tĕr*, that which extracts.

**EDULCORATE**, *v.* *ě-dŭl'kō-rāt* [*L. e*, out of; *dulcis*, sweet; *dulciōr*, sweeter]: to free from acids or other foreign substances by washings or filtrations; to sweeten. **EDUL'CORATING**, *imp.* **EDUL'CORATED**, *pp.*

**EDUR**, *ě-dĕr'*: Rajput state of Guzerat, India; tributary to the Guicowar, being, in common with his immediate dominions, subject to the political superintendence of the presidency of Bombay, being the chief state in the Mahi Kantha agency. Revenue about £60,000. Its cap., **EDUR**, has pop. of abt. 10,000; pop. of state (1881) nearly 220,000.



## EDWARD I.

EDWARD (or EADWARD) I., THE ELDER, King of the Anglo-Saxons: abt. 871–925: eldest son of Alfred the Great. When 22 years old he distinguished himself as a soldier by inflicting a disastrous defeat upon the Danes at Farnham, and at the age of 30 succeeded his father by the voice of the Witan. His claim to the throne, however, was disputed by his cousin Ethelwald, who raised a body of Northumbrian and East Anglican Danes and carried on a civil war for 4 years, when he fell in battle 906. By the aid of his sister, Ethelfleda, Edward accomplished the complete subjugation of the Danes, and became king of all England s. of the Humber.

EDWARD THE CONFESSOR, King of the Anglo-Saxons; abt. 1004–1066, Jan. 5 (reigned 1042–66); b. Islip, in Oxfordshire. On the death of his father, Ethelred, 1016, Canute the Dane obtained possession of the throne, and in the following year married Emma, mother of Edward, by whom he had two sons, Harold and Hardicanute. Until the death of Canute 1035, E. lived in Normandy; he then made an ineffectual attempt to establish his authority in England; but his mother Emma had now transferred her affections to her younger children; and she exerted all her influence and energy in favor of Hardicanute, who, on the death of his brother Harold 1040, became sole ruler of the Anglo-Saxon kingdom. Hardicanute, however, was generous enough to invite his half-brother to England, whither accordingly E. went, and was honorably received. On the death of Hardicanute 1042, E. was declared king. The person chiefly instrumental in bringing about this result was Earl Godwin, whose only daughter, Editha, was married to the king 1044. The lady became only his queen, not the partner of his bed. For this asceticism, the honor of canonization, and the title of Confessor, was conferred on him, about one hundred years after his death, by Pope Alexander III. Scrupulous as E. was in regard to one of the passions, he had no repugnance to gratify another of a far less justifiable kind. His first act after his accession, was to deprive his mother of all her treasures—lifting even the cattle and corn from her fields, and, according to some accounts, endeavoring to compass her death. The whole of E.'s reign is the record of the growth and struggles of the Norman or court party with the national or Anglo-Saxon party; for an account of which see GODWIN: HAROLD. E.'s wars with the Welsh 1057 and '63, and with the Northumbrians 1065, were short and successful. At his death he was succeeded by Harold, son of Earl Godwin. The prosperity of England during the reign of E. was owing to its not being exposed to the wasteful calamities of foreign invasion, while its free intercourse with France, or at least with Normandy, greatly civilized and refined the somewhat Æeotian habits and manners of its inhabitants.

EDWARD I., King of England: 1239, June 16—1307, July 6 (reigned 1274–1307); b. Westminster: eldest son of Henry III. by his wife Eleanor, daughter of Raymond, Count of Provence. That union of valor and intelligence

## EDWARD I.

which characterized him was manifested at an early period. At the commencement of the struggle between Henry and his barons, Prince E., then gov. of the duchy of Guienne, came over to England, and boldly declared his dissatisfaction with his father's conduct. Subsequently, he took the king's side in the war, and by his vigorous generalship put an end to the insurrection in a few years, but there is no evidence to show that he had changed his opinion of Henry's policy; and it is remarkable that he himself, during the whole of his reign, carefully avoided coming into collision with his nobles. When the last of the Crusades was organized, at the instigation of Pope Gregory X., Prince E. arranged with Louis, king of France, to take part in it. Louis died before reaching Palestine, but E. landed at Acre 1271. Nothing, however, of any consequence was achieved; and in the following year he set out on his return to England. At Messina, he heard of his father's death, whereupon he proceeded to France, and did homage to Philippe III. for his French possessions, arriving in England 1274, July 25. He and his queen, Eleanor, were crowned at Westminster Aug. 19. His first military expedition, after accession to the throne, was against the Welsh. After a contest of nearly ten years—in the course of which the famous Prince Llewellyn was slain at Llanfair, 1282, Dec. 11—Wales was finally subdued and incorporated with England. His next ambition was to possess himself of Scotland. The death, in 1290, of Margaret, granddaughter of Alexander III., and known as the Maiden of Norway, who was to have been married to E.'s son, seemed to have frustrated his design; but the selfishness of the ten competitors for the Scottish crown who now appeared, induced them to acknowledge E. as *Lord Paramount* of Scotland, each hoping that he would thereby secure the English monarch's support. The competitors were also foolish enough to make him umpire among them, or perhaps it would be more correct to say, they were not powerful enough to refuse his arbitration. Be that as it may, E. decided in favor of John Baliol at Berwick, 1292, Nov. 17; and Baliol immediately took the oath of fealty to him; and on Dec. 26, at Newcastle, did homage to the English king for his crown. The patriotism and pride of the Scottish nation took fire at such humiliation, and in a short time Baliol was hurried by his subjects into a war with England. In 1296, E. entered Scotland, devastating it with fire and sword. He penetrated as far north as Elgin, compelled Baliol to resign the kingdom, and governed the country by means of his own officers. It was during this expedition that he carried off from the cathedral of Scone the celebrated stone on which the kings of Scotland used to be crowned, and which is now in Westminster Abbey. A second rising took place in Scotland in the following summer. The leader on this occasion was William Wallace (q.v.), whom tradition represents as the most heroic and unselfish of patriots. He was completely successful for a time, chiefly it is to be supposed on account of the absence of Edward. In the spring of 1298, however, that sovereign



again made his appearance in Scotland, and gave battle to Wallace at Falkirk, July 22. Partly through treachery, and partly, no doubt, through the superior generalship of E., who is considered to have been the first military commander of his time in Europe, the Scottish forces were entirely defeated. The next five years were spent by the English king in reducing the country to obedience—with very imperfect success, however. In the summer of 1303, he led a third large army into Scotland, and once more spread havoc and ruin to the shores of the Moray Firth. The last castle that held out against him was Stirling, which did not yield till 1304, July 20. E. wintered at Dunfermline. Some time after this, Wallace either fell into his hands, or was betrayed, and 1305, Aug. 23, was hanged, drawn, and quartered as a traitor, at Smithfield, in London. E. now probably thought that he had no further danger to dread from Scotland, but if so, he was quickly undeceived. Robert Bruce, Earl of Carrick, grandson of the chief rival of Baliol, suddenly left the English court, where he had been residing, in the beginning of 1306, unfurled once more the banner of Scottish independence, and Mar. 27 was crowned at Seone. An English army, under the Earl of Pembroke, was immediately dispatched to Scotland; and at the close of the year, the king himself set out to chastise Bruce. But worn with the ‘sturt and strife’ of many years, the cares of his own kingdom, and the anxieties of conquest, E. lived only to reach Burgh on-Sands, a village beyond Carlisle, where he expired, ‘in sight of that country,’ says Lord Hailes, ‘which he had devoted to destruction.’

E. had most of the qualities that go to form a great ruler: valor, prudence, inexhaustible energy, and pertinacity, are visible in his whole career. He was ambitious, it is true, but in his age, ambition was looked upon as a virtue rather than as a crime; it was the natural accompaniment of kingly courage. His relations to Scotland were unfortunate. Few people of any understanding, however, now doubt that the best thing possible for that country would have been a peaceful union with England, for at that time there was no hatred or jealousy between the two nations. The death of the Maiden of Norway destroyed every chance of such a union, and the great mistake committed by E. was his endeavoring to bring about by force what could prove beneficial only when it was the result of voluntary agreement. The effect of his mad endeavor was to plant in the breasts of the two nations the *germs* of a hitherto unknown hostility, which, in subsequent generations, worked incalculable mischief, and the traces of which have not wholly disappeared even at the present day. As a civil ruler, E. is entitled to the highest praise. Immense progress was made during his reign in the establishment and improvement of law and order throughout the land, the reformation of civil abuses, and the restriction of ecclesiastical jurisdiction and encroachments. He has been called the English Justinian; and both Hale and Blackstone affirm, that ‘the very scheme and model of the

administration of common justice between man and man was entirely settled by this king.' Ireland and Wales participated in the benefits of English law. It was during E.'s reign, too, that the representation of the commons of England first became regular; but probably the greatest advantage obtained by the nation, was the declaration that the right or privilege of levying taxes resided in the parliament. In general, it may be said that E. ruled in harmony with the ideas and desires of the best heads among his nobles and burgesses; and though touchy on the question of his prerogative, like every Plantagenet, and very cruel in his treatment of the Jews, he must be regarded, on the whole, as one of the most enlightened, liberal, and sagacious monarchs of his age.

EDWARD II., King of England: 1284, Apr. 25—1327, Sep. 20 (crowned 1308, Feb. 25); b. Caernarvon, in Wales; son of Edward I. In 1301 he was created Prince of Wales, being the first heir-apparent of the English throne who bore that title. He accompanied his father on his various expeditions into Scotland, and on the death of the latter at Burgh-on-Sands, 1307, he led the English army as far n. as Cumnock, in Ayrshire, after which he returned to his own country. At home, E.'s conduct was contemptible. While still a youth, he had conceived an extraordinary admiration and fondness for a witty, clever, but dissolute creature called Piers Gavestone, son of a Gascon knight. After he became king, there was no limit to the honors heaped on the favorite. When he went to France, in the beginning of 1308, to conclude a marriage with Isabella, daughter of Philippe V., king of France, Gaveston was left guardian of the kingdom. The nobles were indignant, and demanded his banishment. Twice was Gaveston forced to leave England, but as often was he recalled by the weak monarch, whose love for him was sheer infatuation. At last the nobles rose in arms, besieged Gaveston in Scarborough Castle, and having forced him to surrender, hanged him at Warwick, 1312, June 19. Two years after this, E. invaded Scotland at the head of the greatest army ever collected in England—amounting, according to some historians, to 100,000 men. At Bannockburn, 1314, June 24, he was encountered by Robert Bruce (q.v.) and defeated with immense slaughter. This victory put Scotland and England on equal terms for all time coming, and caused the giving up of the attempt at military subjugation of the former country by the latter. Finally, 1319, after numerous petty successes on the part of the Scotch, E. concluded a truce with them for two years. He now exhibited again his imbecile passion for favorites. The person selected on this occasion was Hugh le Despencer. Once more the nobles rebelled, and both Hugh le Despencer and his father were banished 1321, July, but some months later, were recalled by E., and many of the nobles, among others, the Earl of Lancaster, were beheaded in the following year. Immediately afterward, E. invaded Scotland for the last time, and penetrated as far as Culross, in Perthshire; but achieving no great success, he concluded a truce



## EDWARD III.

with that nation for 13 years, and returned to England. A dispute now arose between him and Charles IV. of France, brother of his wife Isabella, in regard to the territories which he held in that country. Charles seized them, whereupon E. sent over Isabella to remonstrate, and, if possible, to effect an amicable arrangement between them. Isabella, it appears, despised her husband, and disliked the Despenchers. Meeting at the French court many English nobles who, entertaining similar feelings, had left their country to avoid the enmity of the favorites, she was easily induced to make common cause with them against her husband and the Despenchers. At the same time, she formed a connection of a criminal kind with Roger de Mortimer, one of the most powerful of the exiles. This of course more thoroughly involved her in the plot against Edward; and having obtained possession of the young Prince of Wales, afterward Edward III., she embarked from Dort, in Holland, with a large body of malcontents, and landed in the Orwell, Suffolk, 1326, Sep. 22. The queen and the banished nobles were soon joined by most of the eminent persons in England. E. fled, but was taken prisoner at Neath Abbey, in Glamorganshire; the Despenchers, father and son, were put to death; and the monarch himself, after being formally deposed 1327, Jan. 25, was murdered in Berkeley Castle, Sep. 20. He left two sons and two daughters.

EDWARD III., King of England: 1312, Nov. 13—1377, June 21 (reigned 1327-77); b Windsor; son of Edward II. He ascended the throne on the formal deposition of his father. During his minority, the country was governed nominally by a council of 12 nobles and bishops, but really by Mortimer and his paramour Isabella, E.'s mother. The young king, 1328, Jan. 24, married Philippa, daughter of the Earl of Hainault; and two years later resolving to take the power into his own hands, he seized Mortimer, and put him to death, 1330, Nov. 29, and banished his mother, Isabella, to her house at Risings (where she lived for 27 years). He next invaded Scotland, to assist Edward Baliol, son of John Baliol, who, in the confusion that ensued on the death of the great Bruce, had made a descent on the country, and had been crowned at Scone. A bloody battle was fought at Halidon Hill, near Berwick, 1333, July 19, in which the Scots were completely defeated. Baliol now assumed the authority of a king, and did homage to E. for his possessions, the result of which act was, that he had to flee the kingdom in a few months, for the thing most intolerable to the Scottish spirit was that any monarch should dare, or fancy he had a right, to surrender the independence of his country. In the course of three years, E. thrice invaded Scotland; but though he frightfully wasted the country, and brought armies with him such as could not be successfully opposed, he could not break the invincible spirit of the people, who, after each invasion had rolled over them like a flood, rose and rallied with a still more stubborn resolution to be free. But the scene of E.'s great exploits was France. Charles IV. having died with-

out a son, Philippe of Valois, nearest heir by the male line, ascended the throne, under the title of Philippe VI. E. claimed the crown in right of his mother Isabella, sister of Charles; but as the law of France expressly excluded females from sovereign rights, E.'s claim was manifestly groundless. The English king admitted that his mother, as a woman, could not inherit the crown of France, but affirmed that he, as her *son*, might. It is clear that he could not receive from his mother rights to which she herself had no claim, yet never was a bad cause ennobled with more splendid triumphs. E. declared war against Philippe 1337. His first campaign was not remarkable; but in 1346, accompanied by his eldest son Edward, known as the Black Prince, he again invaded France, conquered a great part of Normandy, marched to the very gates of Paris, and 1346, Aug. 26, inflicted a tremendous defeat on the French at Crécy (q.v.). Here the Black Prince, though only 16 years of age, evinced the courage and prowess of a veteran, slaying with his own hand the king of Bohemia, who fought on the side of France. After some further successes, such as the reduction of Calais, a truce was concluded between the two nations for several years. Meanwhile, the Scots had sustained a severe defeat at Neville's Cross, near Durham, their king (David) being taken prisoner. In 1356, the war with France was renewed, and Sep. 19, the Black Prince obtained a brilliant victory at Poitiers, King John of France (Philippe having been dead for some years) falling into his hands. The Scotch monarch was released for a ransom of £100,000 in 1357, and King John in 1360, when a peace was concluded between the French and the English, by which the latter were to retain their conquests. King John, however, finding it not consistent with the honor or desire of his country that such a peace should be carried out, magnanimously returned to captivity, and died in London, 1364, Apr. 8. Shortly before this date, David, king of Scotland, whose residence in England had extinguished the little patriotism he ever had, entered into a secret agreement with E., in virtue of which his kingdom—if he died without male issue—was to be transferred to the English sovereign. Meanwhile, the Black Prince, who had married Joanna, daughter of the Earl of Kent, had received from his father Aquitaine and Gascony, and ruled there for some time very prosperously; but ultimately involving himself and his father in a war with France, which was disastrous in its issues, he was compelled, 1374, to conclude a truce for three years. E. waged war no more. In spite of his brilliant victories, in spite of the dazzling valor of his son, he was at the last unsuccessful. Neither in Scotland nor in France did he realize his desires. Affairs at home were no more satisfactory in the last years of his life. He quarrelled with his parliaments, and the Black Prince led the opposition. The latter, however, died 1376, June 8, in the 46th year of his age. (See EDWARD THE BLACK PRINCE.) E. himself died the next year, after a reign of 51 years. By his wife, Philippa, he had seven sons and five daugh-



## EDWARD IV.

ters, several of whom died young. He was succeeded by his grandson Richard, son of the Black Prince, who ascended the throne as Richard II.—The reign of E. was marked by the great progress made in law—a greater number of ‘important new laws being passed than in all the preceding reigns since the Conquest.’ Among these laws were several indicating the increasing repugnance of Englishmen to ecclesiastical, and especially to papal jurisdiction. Trial by jury also now began to supersede other modes of trial. Justices of peace likewise made their earliest appearance in this reign, and legal proceedings were ordered to be carried on henceforth in English, and not in French. Sir James Mackintosh is of opinion, that though E.’s ‘victories left few lasting acquisitions, yet they surrounded the name of his country with a lustre which produced strength and safety.’ It remains to be said that E.’s reign witnessed the culmination of chivalry, and in the Black Prince, possessed a splendid example of its virtues and its vices. The fine arts, especially architecture and poetry, also attained grand development. Chaucer, Gower, and several eminent chroniclers, flourished at this time, and in the sphere of religious reform stands out the noble and thoroughly English figure of Wickliffe.

EDWARD IV., King of England: 1441, Apr. 29 (or 1442, Sep.)—1483, Apr. 9 (reigned 1461–1483); b. Rouen, France; son of Richard, Duke of York, and great-grandson of Edmund, Duke of York, who was the 5th son of Edward III. His original title was that of Earl of March. It is impossible briefly to clear the path through the jungle of family relations by which Richard Duke of York, father of Edward IV., traced his right to the throne. Suffice it to say, that in 1460 the bloody struggle between the *Yorkists* (the party headed by Richard Duke of York, who *at first* professed only a desire to remove from the king, Henry VI., his pernicious councillors) and the *Lancastrians* (the party of the sovereign) ceased for a moment. The Yorkists, on the whole, had been victorious on the battle-field, and their leader contrived to induce parliament to appoint him Henry’s successor. Shortly afterward, however, Henry’s wife—the brave Queen Margaret—raised an army in the north, and, 1460, Dec. 31, encountered and overthrew York on Wakefield Green, the duke himself being slain. But this reverse was compensated for by the success of his son Edward, who, after routing the royal or Lancastrian forces, under the Earls of Pembroke and Ormond, at Mortimer’s Cross, near Hereford, marched toward London, which he entered 1461. Feb. 28. He immediately presented his claim to the crown to parliament, which admitted its validity, and on Mar. 4 ascended the throne as Edward IV, amid the acclamations of the citizens of London, with whom he was a great favorite. For three years he had to struggle to keep his position. His first victory over the Lancastrians was at Towton, in Yorkshire, 1461, Mar. 29, hardly one month after his accession. Finally, 1464, May, a few days after the victory at Hexham, Henry himself fell into E.’s hands.

## EDWARD V.—EDWARD VI.

This closed the war for a time. About this time, E. married Elizabeth Woodville, widow of Sir John Grey. This marriage gave great offense to the Earl of Warwick, by far the most powerful of E.'s adherents, who was at that time prosecuting an alliance between E. and the sister-in-law of Louis XI., king of France. In 1469, Warwick openly declared against him, joined Queen Margaret, and compelled E. to flee the country. King Henry was released from the Tower, where he had been a prisoner for six years, and once more invested with royal authority. But in the spring of 1471, E. landed at the Humber, proceeded swiftly to London, seized the person of Henry, and was again hailed king by the inhabitants. Warwick now gathered an army, and hurried to encounter him. The two met at Barnet, where Warwick was defeated and slain, 1471, Apr. In the course of the next month, E. routed the Lancastrians at Tewkesbury, capturing both Queen Margaret and her son, Prince Edward. The latter was murdered the day after the battle; the queen, herself, after an imprisonment of four years, was ransomed by the French monarch. The later years of E.'s reign presented few political incidents of any moment. E. was an able commander, as his numerous victories show, but he was dissolute in the extreme. It was during his reign that printing was introduced into England, also silk manufactures. In law, few notable changes occurred, but the practice of indirect pleading dates from this period, which is also illustrated with the names of distinguished legists, such as Littleton and Fortescue.

EDWARD V., King of England. 1470, Nov. 4—abt. 1483, June, son of Edward IV. The story of his life is brief and tragic. At the death of his father, 1483, Apr. 9, he was living at Ludlow, in Shropshire, a boy of 13. When the news reached Ludlow, Earl Rivers, his uncle by the mother's side, set out with him for London. Richard Duke of Gloucester, however, contrived to obtain possession of his person at Northampton, and brought him to the capital himself, in the beginning of May. Toward the end of the same month, Richard was appointed Protector of the kingdom. About the middle of June, the young Duke of York, brother of Edward V., also fell into his hands. The two hapless boys were then removed to the Tower, and were never more heard of. The general, and in all probability the correct opinion is, that they were murdered by command of Gloucester himself. All attempts to palliate 'the bloody and devouring chief' have signally failed.

EDWARD VI., King of England. 1537, Oct. 12—1552, July 6; b Hampton Court; son of Henry VIII. by his wife Jane Seymour. The events which happened during his brief reign were of great importance, but they were brought about by others, E. being too young (not 16 years old at his death) to exercise any personal influence on the statesmen or the tendencies of his age. On the death of Henry in 1547, Edward Seymour, Earl of Hertford, became Protector of the kingdom. He was attached to the



## EDWARD.

principles of the Reformation, and during his rule, great strides were made toward the establishment of Protestantism in England. The images were removed from the churches; refractory Rom. Cath. bishops were imprisoned; the laity were allowed the cup at the ceremony of the Lord's Supper; all ecclesiastical processes were ordered to run in the king's name; Henry's famous six articles (known as the Bloody Statute) were repealed; a new service-book, compiled by Cranmer and Ridley, assisted by 11 other divines, was drawn up, and ordered to be used, and is known as the *First Prayer-book of Edward VI.* (see COMMON PRAYER BOOK); and the celibacy of the clergy ceased to be obligatory. In war, Seymour showed himself a brave general. During the first year of his protectorate, he invaded Scotland, on account of the refusal of the Scottish government to fulfil the contract into which it had entered with Henry VIII., by which it was agreed that Mary Queen of Scots should marry Edward. The battle of Pinkie followed, 1547, Sep. 10, in which the Scots were completely beaten; and Seymour, now Duke of Somerset, might have inflicted most serious damage on the whole country if his presence had not been required at home. He returned to find that his brother, Lord Seymour, had been caballing against him. Somerset had him arrested, tried, and condemned for treason, and he was beheaded on Tower Hill, 1549, Mar. 20. In the summer of the same year the Protector quelled an insurrection of the populace headed by one Kett, a tanner; but after a few months, a more dangerous adversary appeared in the person of John Dudley, Earl of Warwick, whose party, by dint of insinuations against Somerset, excited the nation against him, and at last compelled the king to sign his deposition. Somerset was placed in the Tower 1551, Oct. 14, and on Dec. 1 he was tried before the house of lords for treason, condemned, and put to death 1552, Jan. 22. The people regretted, with good reason, his death, for Dudley was both a worse and a weaker man. Before Somerset's execution, Dudley had been created Duke of Northumberland. He was himself (judging from his dying declaration) a Rom. Cath., but he certainly took no means to re-establish the old religion. His great aim was to secure the succession to the throne of England for his family. With this view, he married his son, Lord Guildford Dudley, to Lady Jane Grey, daughter of the Duchess of Suffolk, to whom, by the will of Henry VIII., fell the crown, in default of issue by Edward, Mary, or Elizabeth. Northumberland now worked upon the weak and dying Edward to exclude Mary and Elizabeth, and nominate Lady Jane Grey as his successor. E. at last consented, and a document settling the succession on this lady was drawn up 1552, June. The king lived only a few weeks afterward. Subsequent events entirely frustrated Northumberland's design. King E., during his short reign, founded a great number of grammar schools.

EDWARD VII. See ALBERT EDWARD.

EDWARD THE BLACK PRINCE: 1330, June 15—1376, June 8; b. Woodstock; eldest son of Edward III. and

## EDWARDS.

Prince of Wales, surnamed from the color of his armor. He was created Duke of Cornwall 1337, and Prince of Wales 1343, and after the battle of Crécy, 1346, adopted the crest of three ostrich feathers and the motto *Ich dien*, 'I serve,' which had been borne by King John of Bohemia, who was slain in that battle (see EDWARD III.). This crest and motto has ever since been borne by the Prince of Wales. In 1361, his father consolidated all his dominions between the Loire and the Pyrenees into one principality, and gave it to him with the title of Prince of Aquitaine. He lived a quiet life in his new possessions some years, and was then drawn into Spanish politics. Pedro the Cruel had taken refuge in his dominion, and E. undertook to restore him to his throne. He marched to the frontiers of Castile, met and defeated Henry de Transtamare in battle between Navarette and Najera, restored Henry's rival, Pedro, to the throne, failed to obtain the stipulated recompense, and returned to his possessions with a bankrupt treasury. The taxes he was forced to levy to defray the expenses of this campaign, and to maintain the splendor of his court, made him very unpopular and almost caused open rebellion. The city of Limoges was treasonably surrendered to the French, and when the king of France ordered E. before him to answer the complaints of his vassals, 1369, he took the field with an army of 60,000 men, and finding that the French generals were avoiding an engagement recaptured Limoges, burnt it, and had all its inhabitants killed. Shortly afterward he returned to England. He left a son who became King Richard II.

EDWARDS, *édwèrdz*, AMELIA BLANDFORD, LL.D., L.H.D.: 1831—1892, Apr. 15; author; b. London, Eng. She became known as a contributor to periodical literature 1853, and since then, though known best as a novelist and traveller, wrote many juvenile and educational works besides contributing art and dramatic criticisms, book reviews, and political leaders to the foremost English daily and weekly papers. Her productions in these departments are of high order. She was honorary sec. of the Egyptian Exploration Fund, member of the Biblical Archæological Soc., member of the Soc. for the Promotion of Hellenic Studies, vice-pres. of the Bristol and W. of England National Soc. for Women's Suffrage, contributor of Egyptological articles to the new edition of the *Encyclopædia Britannica*, and author of *Recent Archæological Discoveries in Egypt*, in the American supplement to that work. She lectured in the U. S. 1889.

EDWARDS, BELA BATES, D.D.: 1802, July 4—1852, Apr. 20; b. Southampton, Mass.: Congl. minister; author and editor. He graduated at Amherst College 1824, was appointed tutor there 1826, and was asst. sec. of the American Education Soc. 1828-33. He edited the *American Quarterly Register* for the soc. 1828-42; founded the *American Quarterly Observer* 1833, and edited it after consolidation with the *Biblical Repository* 1835-38; and edited the *Bibliotheca Sacra* 1844-52. In 1837, he became prof. of Hebrew at Andover Theol. Seminary; and 1848, prof. of



Biblical literature there, and held the latter office till death. Besides his editorial labor comprised in 31 vols. 8vo. of the above publications, he published *Biography of Self-taught Men* (1831), *The Missionary Gazetteer* (1832), *Memoirs of Elias Cornelius* (1833), *Memoir of Henry Martyn*, a vol. on the Epistle to the Galatians, and an *Eclectic Reader*, and was associated with Profs. Felton, Park, and Sears, and Samuel H. Taylor, in the preparation of several works on German literature and grammar, and on classical studies. He received the degree D.D. from Dartmouth College 1844. He was as notable for modesty and Christian devoutness as for accurate scholarship and a singularly perfect English style.

EDWARDS, HENRI MILNE: see MILNE-EDWARDS, HENRI.

EDWARDS, JONATHAN: celebrated American divine and metaphysician: 1703, Oct. 5—1757, Mar. 22; b. East Windsor, Conn.; son of the Rev. Timothy E. (q.v.) of East Windsor. He entered Yale College 1716, took his degree B.A. in the following year, and in 1722 was licensed as a Congregational preacher of the gospel. Toward the close of 1723, he was appointed tutor in Yale College, an office which he filled with distinguished success. In 1726, he accepted an invitation to become colleague to his maternal grandfather, Mr. Stoddard, in the pastorate of the First Church (Congl.), at Northampton, Mass., and was ordained 1727, Feb. In the same year he married Sarah Pierrepont, daughter of the Rev. John Pierrepont, of New Haven. In Northampton, he labored with intense zeal for more than 23 years, at the end of which period he was dismissed by his congregation. The immediate cause of the rupture between him and his hearers, was his insisting that no 'unconverted' persons should be allowed to partake at the Lord's Table; but some years before, he had alienated many of the principal members of the church by denouncing certain improper and injurious practices which were tolerated in the community, and by attempting to make a public example of the offenders. E. was a powerful and impressive preacher, sombre in his religious opinions and sentiments, yet singularly pure and sweet in character and in thought, fervently devotional, earnest, unaffected, and nobly conscientious. He was eminently 'spiritually-minded'—indeed with such habitual vision of spiritual things as at times exalted his feelings to what would have been ecstasy except for the calm reasonableness and balance of his mind. During the famous 'Revival' of 1740-41, he was much sought after as a preacher, and is in fact often regarded as the originator of that movement. Certain it is that as early as 1734, a local manifestation of religious enthusiasm, involving many remarkable occurrences, had taken place in his own parish, of which he published an account entitled *A Faithful Narrative of the Surprising Work of God, in the Conversion of Many Hundred Souls in Northampton*. The quarrel between E. and his congregation shows, however, that the 'revival' had not exercised an enduring influence on the community in general, since only a few years elapsed

between the ecstasies of devotion and the outbreak of antagonism. After his dismissal in 1750, E. retired to a humble work as a missionary among the Indians of Massachusetts, near Stockbridge. While thus engaged, he composed his famous treatises on the *Freedom of the Will* and *Original Sin*. In 1757, he was chosen pres. of Princeton College, N. J., whither he proceeded 1758, Jan., but was cut off by small pox only five weeks after his inauguration. E. will always be considered a master in dogmatic theology. Calvinism had probably never so powerful a defender. As a preacher, though without the graces of rhetoric, he had a lofty and sustained imagination, and deep sensibilities. As a writer, in the judgment of Robert Hall, 'he ranks with the brightest luminaries of the Christian Church, not excluding any country or any age since the apostolic.' His great characteristics are depth and comprehensiveness of argument; and were it not that the age for such discussions as E. engaged in is gone by, few philosophical writings would be more read than his, as certainly few would be more worthy of patient study than those of this illustrious divine. Besides the works already mentioned, E. wrote a *Treatise concerning Religious Affections*, the *History of Redemption*, a *Dissertation concerning the End for which God created the World*, and a *Dissertation concerning the True Nature of Christian Virtue*. The three last were posthumously published. A complete edition of E.'s works was published by Dr. Timothy Dwight in 10 vols. (1809), and another at London 1817. A third was published 1840, with an essay by Henry Rogers, and memoir by Sereno E. Dwight.—Students of his life and times usually feel the charm of this sincere and humble yet lofty soul; while those easily condemn him who either view him only from afar or test him by the standards of an age of compromises.

EDWARDS, JONATHAN, D.D.: theologian and pres. of Union College; known as the Younger Edwards, or the Second Pres. E.: 1745, May 26—1801, Aug. 1; b. Northampton, Mass.; second son of Jonathan E., the distinguished metaphysician. His life was remarkably like that of his father in its main incidents. When six years of age he went with his parents to Stockbridge; his schoolmates were Indian children, and he learned their language so perfectly that it was the vehicle of his very thoughts. In his tenth year his father sent him to the Susquehanna river to learn the Oneida language with reference to a missionary life; he was there under the care of the Rev. Gideon Hawley. He was again in Stockbridge 1756–58, and four years at Princeton, graduating 1765. After a course of theology with Dr. Bellamy in Conn., and a tutorship at Princeton 1767–69, he was pastor of the Congl. Church in White Haven (a part of New Haven, Conn.) for 26 years: this position he left for reasons similar to those that led to his father's dismissal from Northampton. He was pastor in Colebrook, Conn., two years, and became pres. of Union College 1799. He was a man of great ability, did much to elucidate his father's philosophy and the theology of the time, and published much, including masterly *Observations on the Language of the Muhhaneew Indians* (1788). His collected writings appeared in two vols. 1842.



EDWIN, English Saxon prince: d. 634; son of Ella, king of Northumbria (died about 589). Edwin succeeded to the throne at the age of three years, but a neighboring potentate, Ethelfrith, invaded and conquered his territories, whereupon the infant E. was carried into N. Wales, and was there educated. When he grew up to man's estate, Ethelfrith, fearing that his power would not be secure so long as E. lived, forced him from his asylum, and for many years he wandered about a disguised fugitive. Reaching East Anglia, he claimed the protection of King Redwald, which was readily granted. While residing there, Ethelfrith sent messengers to Redwald, requiring him to deliver E. into his hands, and threatening war in the event of a refusal. Redwald promised to accede to the request. A friend made known the resolve to the prince, and counselled flight; to this E. would not consent, but sat down outside the palace, brooding over his misfortunes. While sitting there, Bede states that an unknown person approached him, and promised release from all his sufferings, if he would listen to what should be afterward taught him. The apparition then placed its hand upon his head, and, bidding him remember the interview and the sign, disappeared.

Redwald's queen pleaded the cause of E., and Redwald finally determined to protect him, raised an army, surprised Ethelfrith on the Idel, in Nottinghamshire, and defeated and slew him in 617. When E. regained his kingdom, he wooed Edilberga, daughter of Ethelbert of Kent. Her brother, who was a Christian, objected to her alliance with an idolater; but E. promised that he would not interfere with her religious belief. The princess became his wife; and Paulinus, who had been sent by Gregory to assist Augustine in his mission, accompanied her as her bishop.

About this time, E.'s life was attempted by an assassin, sent by the king of Wessex. He escaped with a slight wound, and on the same night the queen was delivered of a daughter. The king thanked his idols for the birth, but Paulinus directed his thankfulness to the Christian Savior. The king promised to accept the new faith, if heaven would grant him victory over the king of Wessex. His child and eleven of his household then received the rite of baptism. Raising an army, he defeated his foe, but delayed to fulfil his promise. Paulinus, having heard of the apparition which appeared to him while residing at the court of Redwald, one day entered the apartment in which E. sat, and placing his hand upon his head, asked him if he remembered the sign. The king was visibly affected, and at once assembled his Witenagemôte to deliberate on the matter of the new religion. Coifi, the high priest, spoke first, and intimated his willingness to desert the idols, and embrace the Christian faith. A thane next rose and pronounced the beautiful speech which has been versified by so many poets, but which is most effective in the simple serious Saxon of the chroniclers. Coifi then headed the people in destroying the idol temple.

**E.** and the nobility of his kingdom were baptized in the eleventh year of his reign. Thereafter, he became the most powerful prince in England. He subdued a part of Wales, and his power extended n. to the Lothians. In 634, he fell in battle at Hatfield Chase, in Yorkshire; and in that disastrous fight, one of his children, and the greater portion of his army, perished. The history of this prince has been made the subject of a beautiful poem (*Edwin of Deira*, 1861) by Alexander Smith.

**EE**, n. *é*: in *Scotch* and *prov. Eng.*, an eye. **EEN**, n plu *ēn*, the eyes.

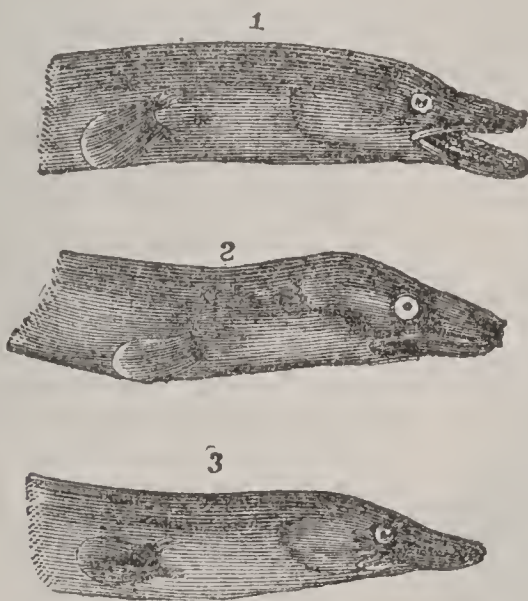
**ECKHOUT**, *āk'howt*, GERBRAND VAN DEN: 1621, Aug. 19—1674, July 22; born in Amsterdam, Holland; painter. He studied painting with Rembrandt, and in the composition of his pictures, particularly his Biblical subjects, followed the style of his master closely, and imitated his color effects, though preserving a cooler tone. Among his works are *The Resurrection of the Daughter of Jairus*, now in the Berlin Museum; *The Presentation in the Temple*, in the Dresden Gallery; *The Woman taken in Adultery*, Amsterdam Gallery; *David and Abigail*, Schleissheim Gallery; and *Hannah giving Samuel to be Dedicated to the Lord*, in the Louvre. His strongest points were portraiture and expression.

**EECLOO**, *ā-klō'*: town of Belgium, province of E. Flanders, on the high road between Ghent and Bruges, 12 m. n.w. from Ghent. It is clean and well built; and has manufactures of woolens, cottons, hats, tobacco, chocolate, soap, etc.; also breweries, distilleries, vinegar works, salt-refineries, dye-works, oil-mills, and a thriving trade in linen, cattle, and timber, as well as in grain, for which it has a large weekly market. Pop. 11,164.



## EEL.

EEL, n. *ēl* [Icel. *áll*, an eel: Dut., Dan., Ger. *aal*: Fin. *ilja*, slimy: Esthon. *illa*, slime, saliva: Skr. *ahi*, a snake]: name popularly given to all serpent-shaped or worm-shaped fishes, and sometimes extended to other animals of similar form, but otherwise extremely different, as the *eels* in paste, in vinegar, etc. The fishes to which this name is most commonly applied are *malacopterous* fishes destitute of ventral fins, and having the body covered by a soft thick slimy skin, the scales very minute, and often almost invisible, or entirely lacking. Most of them were included in the Linnæan genus *Muræna*, and now constitute the family *Murænidae*, divided by some naturalists into the families *Synbranchidae*, *Murænidae*, *Anguillidae*, *Congeridae*, and *Ophichthidae*. All these have the skeleton destitute of ribs, and the fin-rays not jointed; while the *Gymnotidae*, including the electric eels (see GYMNOTUS), have ribs encompassing the belly, and the fin-rays jointed or branched. In all the eels, the gill-orifices are very small, and are situated far back, so that there is a long passage from the gill-chamber outward; and hence, the gills not soon becoming dry, these fishes can remain out of water for a considerable



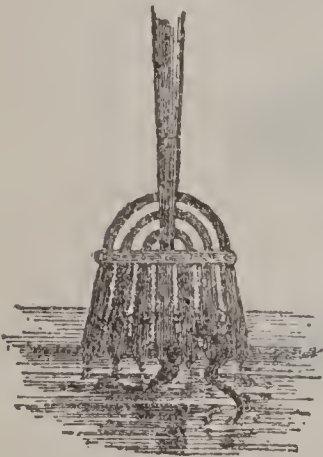
Heads of Eels:

- 1, The Snig (*Anguilla mediorostris*); 2, Broad-nosed Eel (*Anguilla latirostris*); 3, The Grig (*Anguilla platbec*).

time without injury, and some of them occasionally leave it of their own accord. The smallness of the gill-opening is also regarded as probably indicative of feebleness of respiration; and this, as in reptiles, is connected with extreme tenacity of life.—The *Synbranchidae* have the gill-passages so united under a common integument, as to present externally only a single orifice. They are almost destitute of fins.—The species are few, and found only in tropical and sub-tropical seas.—The *Murænidae* also are generally destitute of fins, or nearly so; they all are destitute of scales. All are marine.—The *Anguillidae*, on the contrary, are fresh-water fishes, though some of them oc-

casionally visit the sea. They have rather large pectoral fins, anal and dorsal fins extending to and encompassing the tip of the tail, and numerous longish scales imbedded in groups in the skin, so as to resemble lattice-work. To these the congers (q.v.), though marine, are very nearly allied. The *Ophisuride*, or snake-eels (q.v.), of the Mediterranean and other seas, are more widely different, and are easily distinguished by the tail ending in a conical finless point.

American ichthyologists are disposed to accept the view of M. C. M. Dareste that there is but one species of *Anguilla* belonging to the n. hemisphere, namely, *A. vulgaris*, or *A. anguilla*, if, by the rule of priority, Thunberg's generic name be combined with Linnæus's identical specific one. From its countless but intergrading variations, error has resulted in the naming of many forms as species, of which three are given in the figures herewith. It also varies much in color. (Dareste does not even find any distinct barriers between this and two other species or types of the genus in the Indian ocean and a fourth in Oceanica.) *A. vulgaris* may therefore be said to occur on the w. coast of the Pacific; in and around Europe, except the Black Sea and the Danube and its tributaries; and on the shores and in the rivers of e. N. America, except in waters tributary to Hudson Bay. It is found throughout the Mississippi valley. Probably it was introduced in waters above Niagara Falls, when carried alive in tubs, for food.



Eel-spear.

Eels are taken in great numbers during winter by means of *eel-spears*, or forks with several prongs, plunged into the mud. Sometimes they are dug out of the mud of river-banks, where large numbers are found congregating together. The eels which descend to estuaries or to the sea deposit their spawn there, and countless multitudes of young eels ascend rivers in spring. The passage of the young eels is called on the Thames the *eel-fare*, from a Saxon word signifying to pass or travel. So strong is the instinct which impels them, that they

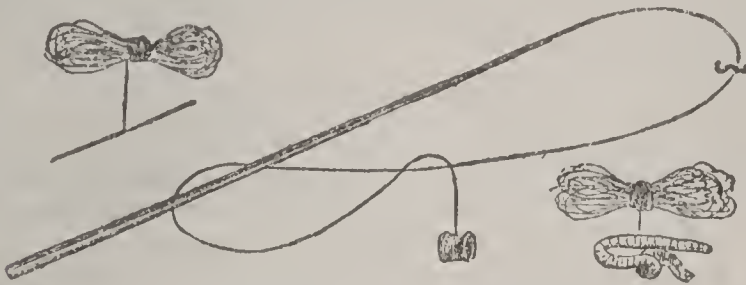
surmount obstacles apparently far more than sufficient to arrest their progress; they have been seen to ascend the large posts of floodgates, 'those which die, stick to the posts; others, which get a little higher, meet with the same fate, until at last a sufficient layer of them is formed to enable the rest to overcome the difficulty of the passage.' Young eels have also sometimes been met in large numbers performing migrations on land among moist grass, generally in the evening or during the night; but the purpose of these migrations is not understood, nor are they known to take place with regularity.—Those eels which cannot migrate to the sea, breed in inland rivers and lakes.



Eels are very averse to cold, and to this is ascribed their winter descent to brackish water, or hiding in mud. The number of known species is large, but all belong to the temperate and warmer regions of the globe. In these also, the marine fishes to which the name E. is sometimes extended, chiefly abound.

There is a prejudice in some countries—particularly in Scotland—against eating eels, on account of their serpent-like appearance; but generally, as in England, they are highly esteemed. The London market is very largely supplied with eels from Holland; they are sent over alive in welled vessels.

There are various means besides those already noticed employed for the capture of the eel. Weirs and stages are erected across rivers, and baskets, or *bucks*, as they are termed, fixed in them for the taking of the eels during their migrations. These baskets are of large size, and shaped like a huge Chinese jar, in the mouth of which is fitted a sort of funnel-shaped mouse-trap entrance, composed of flexible withy rods coming inward to a point, and through which the eels can easily force their way; but when they turn about to find the entrance again, it is closed against them. When the eels are running, as it is termed—that is, during their migrations—many hundredweights are often taken in these basket-traps in a single night.



Eel Snigging Apparatus.

*Fel-pots* also are used for their capture. These are similar to the bucks, but smaller and more slender. They are sunk, by means of bricks tied to them, in the most likely runs or narrow spaces between weeds, or close to banks, and through which eels are likely to run. After a thunder-storm, eels always run well, as it disturbs them greatly. Eels are caught also by means of night-lines. These are long lines with heavy weights at each end, and in the middle if necessary, with hooks tied on every yard. These hooks are baited with pieces of dead fish, minnows, or worms. The line is sunk, and laid across stream—or, if fishing for conger eels, in the sea—with, if it be thought necessary, a small buoy at one end, to recover the line by. These eel lines should be hauled as early in the morning as possible, or the best eels will be found to have worked themselves off, leaving a mass of knots and slime behind them to show where they have been. *Snigging* is a favorite amusement with some anglers. A rod or a long stick is provided, bent round at the slender end like the top of a

## EEL-GRASS—EELS.

very well used fishing-rod; on the point is fixed a single ring; through this ring is passed a piece of string; one end of this is held in the fisherman's hand. To the other end, on some fine but strong cord, is fastened a stout darning-needle, tied to the cord by the middle. The needle is then baited, or thrust lengthwise into a large lob-worm, until the fine cord alone comes out of the head of the worm. The worm is then drawn up to the ring of the rod. The fisherman then seeks for some hole in which he thinks an eel may be, and applying the point of the rod, pushes the worm into it. As soon as the fisherman believes an eel has swallowed the bait, he gives a slight pull to the string; and the needle, which has gone down the eel's throat inside the worm perfectly straight, being tied by the middle, turns crosswise in the eel's throat or stomach, and hooks him. *Clod-fishing* is thus practised: a quantity of lob-worms are strung by means of a needle on some stout worsted until a considerable bunch of them is obtained; this is tied to the end of a cord, which is again tied to a stout pole. When the eels are on the move, the fisherman takes his station with a pail half-full of water within reach; he then drops his clod into the water, and allows it to sink to the bottom. As soon as he feels an eel tugging at it, he steadily and quickly, but without jerk, raises the bait from the water. The eel frequently has its teeth so entangled in the worsted as to be unable to let go, and thus is lifted from the water. The bait is held over the pail, a shake or two dislodges the eel.

EEL-GRASS: see GRASSWRACK: TAPE-GRASS.

EEL'-POUT: name given in parts of England to the burbot, and on the Scottish coast to the viviparous blenny; in N. America to the fam. *Lycodidae*; example, the Mutton-fish or Mother of Eels, Congo or Lamper.

EELS in paste, vinegar, fermenting and decaying substances, or stagnant water: minute worms belonging to the genus *Anguillula* of the order *Nematoidea* (q.v.). Their bodies are mostly cylindrical and transparent, so that one can easily see mouth, stomachs, and intestines of the creature. They multiply with extraordinary rapidity, so that in suitable places millions speedily swarm. Other Nematoids are the *Ascaris* (q.v.), Guinea-worm (q.v.), *Trichina* (q.v.) and see also ENTOMOA. Like other lower forms of life, these creatures may be dried, and will retain their vitality for months and even years. This is perhaps owing largely to the thick chitinous cuticle which covers them externally, and is impervious to moisture. The eggs also are thick shelled, and do not easily lose their capability of development. The almost universal distribution of the group is explained by these facts. There are many species of *Anguillula*, some of which live in salt and fresh water, damp earth, etc.; the majority, however, live in putrefying animal and vegetable substances, while some few are parasitic; *Anguillula tritici* lives in ears of wheat, and gives rise to the disease known as ear-cockles (q.v.)



## E'EN—EFFEIR.

E'EN, E'ER, *ēn, ār*: contractions for *even* and *ever*.

EERIE, or EERY, a. *ē'rĭ* [Scot. *erie*: comp. Gael. *eirē*, a burden]: serving to inspire fear; wild; affected with fear; ghastly. EERIESOME, a. *ēr'ĭ-sŭm*, causing fear by the supernatural.

EF, prefix, *ĕf*: another form of Ex, which see.

EFAT: see SHOA: ABYSSINIA.

EFFACE, v. *ĕf-fās'* [F. *effacer*, to blot out—from L. *ex*, out; *faciēs*, the face: F. *face*, a face]: to destroy or render illegible; to wear away; to strike or rub out; to destroy any impression on the mind. EFFA'CING, imp. EFFACED', pp. *-fāst'*. EFFACE'ABLE, a. *-ā-bl*, capable of being rubbed out. EFFACE'MENT, n. act of effacing.—SYN. of 'efface': to obliterate; expunge; erase; cancel; destroy; delete; rub out; scratch out.

EFFARÉ, in Heraldry: see EFFRAYÉ (under EFFRAY).

EFFECT, n. *ĕf-fĕkt'* [OF. *effect*—from L. *effectus*, effected, made, finished—from *ex*, out; *fāciō*, I make]: result or consequence of a cause or agent; consequence; result; in *art*, impression produced by certain combinations, as in a picture; especially the general impression produced on the mind by the first sight of a picture or other work of art, or the impression which it produces when seen from so great a distance as to render the details invisible. The term has reference both to design and coloring, both of which, if correctly indicated, may be judged with confidence before either has been completed in detail. Bold sketches of works are generally made beforehand by careful artists for the purpose of adjusting the composition and coloring to produce the desired effect: V. to produce; to bring to pass; to accomplish. EFFEC'TING, imp. EFFEC'TED, pp. EFFEC'TER, or EFFEC'TOR, *-tēr*, n. one who. EFFEC'TIBLE, a. *-tĭ-bl*, that may be done. EFFEC'TIVE, a. *-tĭv*, having power to effect; producing effect; active; serviceable; operative: N. a soldier who is fit for duty. EFFEC'TIVELY, ad. *-lĭ*, powerfully; with real operation. EFFECT'LESS, a. EFFEC'TIVENESS, n. EFFECTS', n. plu. goods; movables. EFFEC'TUAL, a. *-tŭ-āl*, producing the effect intended or desired; efficacious; complete. EFFEC'TUALLY, ad. *-lĭ*. EFFEC'TUATE, v. *-āt* [mid. L. *effectŭātus*, effected: F. *effectuer*, to effect]: to bring to pass; to accomplish. EFFEC'TUATING, imp. EFFEC'TUATED, pp. IN EFFECT, really; virtually. FOR EFFECT, for show; to produce an impression only. OF NO EFFECT, without practical results; destitute of force or validity. TO GIVE EFFECT TO, to carry out or complete.—SYN. of 'effect, v.': to achieve; execute; fulfil; realize, effectuate; complete; cause;—of 'effect, n.': production; event; impression; force; importance; purpose;—of 'effective': effectual; efficient; efficacious; forcible; energetic; active; powerful;—of 'effects': commodities; chattels; merchandise; wares; property; possession.

EFFEIR, v. *ĕf-fēr'* [perhaps L. *effēr'rē*, to carry out, to set forth]: in *Scot.*, to become; to fit; to fall to be paid

## EFFEMINATE—EFFICIENT.

as a fit proportion. **EFFEIR'ING**, imp. **EFFEURED**, pp. *ěf-fěrd'*.

**EFFEMINATE**, a. *ěf-fěm'ĩ-nāt* [L. *effeminātus*, made womanish—from *ex*, *femīna*, a woman: It. *effeminare*: F. *efféminer*]: soft and delicate as a woman; womanish; unmanly; weak: V. to make womanish; to unman; to soften. **EFFEM'INATING**, imp. **EFFEM'INATED**, pp. **EFFEM'INATELY**, ad. *-lĩ*. **EFFEM'INATENESS**, n. **EFFEM'INACY**, n. *-ĩ-nā-sĩ*, unmanly delicacy; womanish weakness; voluptuousness.—**SYN.** of 'effeminate, a.': womanly; tender; delicate; voluptuous; soft.

**EFFENDI**, n. *ěf-fěn'dĩ* [Turk. *efendi*, sir: mod. Gr. *ap̄hentēs*, a ruler]: title of honor among the Turks, bestowed upon civil dignitaries, men learned in the law, and persons of various ranks, in distinction from the title of Aga, born by courtiers and military men. The word is equivalent to the English Sir, or the French Monsieur, and is frequently added to the name of an office. Thus, the sultan's first physician is termed *Hakim-effendi*; the priest in the seraglio, *Imam-effendi*; and the minister of foreign affairs, was formerly called *Reis-effendi*.

**EFFERENT**, a. *ěf-fěr-ěnt* [L. *effērēn'tem*, bringing or carrying out—from *ef*, out of; *fero*, I bear or carry]: in *anat.*, conveying from or outward; carrying from the centre to the periphery: N. a vessel which carries outward, distinguished from *afferent*, which means 'conveying into or toward'; a stream bearing away the water of a lake.

**EFFERVESCE**, v. *ěf-fěr-věs'* [L. *efferves'cēre*, to boil up or over—from *ex*, out; *fervēre*, to boil, to be hot]: to bubble up, as in boiling, or as the result of an acid uniting with a carbonate; to froth up, as in the fermenting of liquids. **EF'FERVES'ING**, imp.: **ADJ.** bubbling up. **EF'FERVESCED'**, pp. *-vēst'*. **EF'FERVES'CENT**, a. *-sěnt* [F.—L.]: gently boiling or bubbling. **EF'FERVES'CENT**, n. *-sěns*, the frothing or bubbling up of liquids from the generation and escape of gas. **EF'FERVES'CIBLE**, a. *-sĩ-bl*, capable of producing effervescence. **EFFERVESING DRAUGHTS**: see **AĒRATED WATERS**.

**EFFETE**, a. *ěf-fět'* [L. *effētus*, barren, worn out—from *ex*, out; *fātus*, the young of any creature]: worn out; barren; exhausted.

**EFFICACIOUS**, a. *ěf-fĩ-kā'shūs* [F. *efficace*, efficient—from L. *efficācem*, effectual, powerful—from *ex*, out; *fāciō*, I make or do]: producing the effect intended; effectual. **EF'FICA'CIOUSLY**, ad. *-lĩ*. **EF'FICA'CIOUSNESS**, n. *-něs*. **EF'FICACY**, n. *-kā-sĩ*, power to produce effects; virtue; power; ability.

**EFFICIENT**, a. *ěf-fĩsh'ěnt* [F. *efficient*—from L. *efficiēns* and *efficiēn'tem*]: producing effects; able; competent; material: N. that which produces effects; he that makes; a thoroughly trained and capable soldier. **EFFICI'ENTLY**, ad. *-lĩ*. **EFFI'CIENCE**, n. *-ěns*, or **EFFI'CIENCY**, n. *-ěn-sĩ*, a causing to be or exist; effectual agency; power of performing



## EFFIERCE—EFFRONTERY.

works.—SYN. of 'efficient, a.': effectual; effective; capable; efficacious.

**EFFIERCE**, v. *ěf-fěrs'* [L. *ef*, to make, and *fierce*]: in *OE.*, to make fierce; to enrage. **EFFIERCING**, imp. **EFFIERCED**, pp. *ěf-fěrst'*.

**EFFIGY**, n. *ěf'fĩ-jĩ* [It. and F. *effigie*—from L. *effigĕm*, an image—from *ex*, out; *figo*, I form]: the image or likeness of a person, whether a full figure or in part, as on a coin; a portrait: see **BRASS**, **MONUMENTAL** (the word is scarcely artistic). **EFFIGIAL**, a. *ěf'fĩ-jĩ-ăl*, pertaining to, or having the character of, an effigy. To **BURN** or **HANG** IN **EFFIGY** [L. *in effigĕ*]: to burn or hang the image or figure of a person.

**EFFLORESCE**, v. *ěf'flō-rěs'* [L. *efflores'cĕrĕ*, to blow, or bloom, as a flower—from *ex*, out; *florem*, a flower]: to become covered with crystals, as the moisture frozen on a pane of glass; to form a mealy powder on the surface, as of a liquid; to become dusty on the surface; in *chem.*, to change from a compact or crystalline state to a powder, by losing water of crystallization, as common washing-soda when exposed to the air. **EF'FLORES'CING**, imp. **EF'FLORESCED'**, pp. *-rěst'*. **EF'FLORES'CENCE**, n. *-rěs'ěns* [F.—L.]: the being in flower; bloom; redness of the skin; a mealy substance which covers certain minerals when exposed to the action of the atmosphere; white incrustation on the walls of buildings. **EF'FLORES'CENT**, a. *-ěnt* [F.—L.]: shooting out in flowers; forming a white powder on the surface; throwing out minute needle-like crystals.

**EFFLUENT**, a. *ěf'flů-ěnt* [L. *efflũens* or *efflũen'tem*, flowing or running out—from *ex*, out; *flũens*, flowing: F. *effluent*]: flowing out: N. a stream which flows out of another stream, or out of a lake. **EF'FLUENCE**, n. *-ěns*, that which flows from any body or substance.

**EFFLUVIUM**, n. *ěf'flů'vĩ-ũm*, **EFFLU'VIA**, n. plu. *-ă* [L. *efflůvĩũm*, a flowing out—from *ex*, out; *flũō*, I flow]: the invisible vapor or gas arising from putrefying matter or from diseased bodies; a disagreeable smell. **EFFLUX**, n. *ěf'flůks* [L. *effluxus*, flowed out]: that which flows out; a flowing out or issuing in a stream.

**EFFORT**, n. *ěf'fört* [F. *effort*—from L. *ex*, out; F. *force*, strength—from L. *fortis*, strong: mid. L. *fortĩă*, strength]. exertion; endeavor; strain of mind or body. **EF'FORTLESS**, a. without effort.—SYN. of 'effort': attempt; essay; endeavor; trial; exertion; experiment; struggle; strain.

**EFFRAY**, v. *ěf-fră'* [F. *effrayer*, to frighten—from mid. L. *exfrigidārĕ*, to freeze with fright—from L. *frigidus*, cold]: in *OE.*, to frighten; to scare; to affray. **EFFRAIDE**, pp. *ěf-frăd'*, in *OE.*, frightened; scared. **EFFRAYÉ**, *ă-fră-yă*, or **EFFARÉ**, *ă-fa-ră*, in *heraldry*, applied to an animal represented as rearing on its hind legs as if it were frightened or enraged.

**EFFRONTERY**, n. *ěf-frũn'tér-ĩ* [F. *effronterie*, impudence—from L. *ex*, out or forth; *frontem*, the forehead]:

## EFFULGE—EGBERT.

impudence; shameless boldness.—**SYN.**: boldness; assurance; audacity; hardihood; shamelessness; sauciness.

**EFFULGE**, v. *ěf-fŭlj'* [L. *effulgens* or *effulgen'tem*, shining or gleaming forth—from *ex*, out; *fulgĕō*, I shine]: to shine with splendor. **EFFUL'GING**, imp. **EFFULGED'**, pp. *-fŭljĕd'*. **EFFUL'GENT**, a. *-jĕnt*, diffusing a flood of light; bright. **EFFUL'GENCE**, n. *-jĕns*, great lustre or brightness; splendor. **EFFUL'GENTLY**, ad. *-lĭ*.

**EFFUSE**, v. *ěf-fŭz'* [L. *effusus*, poured out or forth—from *ex*, out; *fŭsus*, poured]: to pour out; to spill or shed, as a fluid. **EFFU'SING**, imp. **EFFUSED'**, pp. *-fŭzd'*, poured out; shed. **EFFUSION**, n. *ěf-fŭzhŭn* [F.—L.]: a shedding or spilling; act of pouring out; what is poured out. **EFFU'SIVE**, a. *-siv*, flowing abundantly; that pours out largely. **EFFU'SIVELY**, ad. *-lĭ*.

**EFT**, a. *ěft* [see **AFTER**]: in *OE.*, used for 'after'; ready; convenient. **EFTSOONS**, ad. *ěft-sŏns'*, in *OE.*, soon afterward.

**EFT**, n. *ěft* [AS. *efete*, an eft: Skr. *apada*, a reptile—from *a*, not; *pad*, a foot]: a small lizard; a newt—the two, notwithstanding important differences, having been till recently confounded even by naturalists. The Scotch word *ask* seems the exact equivalent of the English *eft*. In works of natural history, the term eft is now used as synonymous with **NEWT** (q.v.).

**EGALITÉ**, **PHILIPPE**: see **ORLEANS**, **LOUIS PHILIPPE JOSEPH**, Duc d'.

**EGAN**, *ě'gan*. **PATRICK**: 1841—————; politician: b. Ballymahon, Longford co., Ireland. Going to Dublin, he found employment with a grain merchant there, and before he was 25 yrs. old was the head of a large house in the grain business. About 1865 he entered political life, and for 20 yrs. was one of the leaders of the popular party in Ireland. He was one of the founders of the Land League, and its treasurer till he fled to the United States to escape prosecution on the charge of treason-felony. He then engaged in business as dealer in grain at Lincoln, Neb. E. was appointed by Pres. Harrison U. S. minister to Chili 1889. In the civil war between the Chilian president, Balmaceda, and the Chilian congress, E. saved the lives of a number of leaders on one or the other side by giving them asylum under the U. S. flag. On the downfall of Balmaceda and the demand that the fugitives should be delivered up, relations between the new govt. and E. as U. S. minister were seriously strained. He resigned in 1893.

**EGAN**, **PIERCE**: 1772-1849, Aug. 3; b. England, of Irish descent: sporting writer and humorist. He became famous as a journalist and sporting writer early in life. His chief humorous works were *Boriana*; *Life in London*, or, *the Day and Night Scenes of Jerry Hawthorn and Corinthian Tom*, which was illustrated by George Cruikshank, and a companion vol., *Real Life in London*. His works were widely circulated.

**EGBERT**, *ěg'bĕrt*, King of the West Saxons: most celebrated of the Anglo-Saxon kings before Alfred. He



## EGBERT.

reigned 800–836, and was son of Ealmund, who is said to have reigned in Kent, descendant of the House of Cerdic. In 787, on the death of Cynegils, king of Wessex, E. laid claim to the throne, but had to give way to another claimant, Beorhtric who was more powerful. E. was compelled to flee, and took refuge at the court of Charlemagne. Here he remained 13 years, until, in 800, on the death of Beorhtriche he was summoned to England to fill the throne of Wessex. England was at this time divided into three great sovereignties: Northumbria, extending over what were occasionally the separate kingdoms of Deira and Bernicia; Mercia, which had now subjugated the petty powers of Kent, Essex, and East Anglia; and Wessex, which had absorbed Sussex. For the first nine years of his reign, E. drew no sword. His mild government completed the attachment of his subjects, and the peace which he maintained fostered his strength. In 809, however, he marched against the Britons of the west, and after fighting five years in Cornwall and Devon, he succeeded in subduing the wild tribes to at least a temporary subjection. In 823, the most important event in his career took place. At that time a dispute had arisen between the East Angles and their Mercian conquerors, and the former sent ambassadors to E. imploring aid and protection. E. joined the East Angles with an army which, according to the old chroniclers, had a peculiarly fighting appearance, being ‘lean, meagre, pale, and long-breathed.’ The encounter between the Mercians and the East Angles with their ally took place at Ellandûn (the modern Wilton, according to some), where a furious battle was fought, in which the Mercians were defeated with great slaughter. By this battle the power of Mercia was broken, and Essex and Kent, formerly Mercian provinces, became incorporated with Wessex. For four years after the great battle of Ellandûn, Mercia remained the seat of discontent and strife, and E., in 827, taking advantage of his opportunity, led thither an invading force, and reduced the country to vassalage. Turning next his arms against Northumbria, he compelled that sovereignty also to acknowledge his supremaey (827–828). He afterward penetrated into Wales, where, in like manner, success attended his arms.

E., now virtually king of England, though both he and his successors until the time of Alfred were in the habit of designating themselves only kings of Wessex, found it necessary, after a few years’ comparatively peaceful rule, to direct his attention to a new and foreign enemy. The Danes, who had been making frequent descents upon the island since 832, and who in that year had defeated the forces of E., reappeared in 835 on the coast of Cornwall, where they were joined by numbers of the Cornish Britons. E., however, at the head of his West Saxons, met them at Hengestes dûn (Hengstone), and in a great battle completely overthrew them. In the following year he died, after a reign of 37 years.—In E., ambition and prudence, bravery, talent, and courtesy were blended in such a manner as to form a monarch not unworthy to be the first king of England.

## EGEDE—EGERIA.

**EGEDE**, *ĕg'eh-dĕh*, HANS: 1681, Jan. 31–1758; b. in Norway, in Norway. He studied in Copenhagen, and was appointed to the church of Vaagen in Norway 1707. Having determined to proceed to Greenland to convert the natives, he resigned his cure at the end of ten years; and, after devoting himself with assiduity to the study of the language, embarked for Greenland, with his wife and sons, 1721. He remained 15 years in Greenland, during which time he labored zealously among the people, and by his preaching and teaching secured a permanent footing there for the Christian mission, which owed its origin to him. On his return to Copenhagen, he employed himself in instructing missionaries in the dialects of Greenland; and in 1740 he was made a bishop. He has described the course and success of his labors in *Det gamle Grönland's nye Per-lustration* (Copenh. 1729 and '41). He was ably seconded in his labors by his wife and his sons, Povel and Niels.—**POVEL** E., who succeeded his father HANS in Greenland, and was also a bishop, translated the gospels and several devotional works into the Greenland language, and compiled a grammar and dictionary for the use of the Greenland mission; the latter appeared 1750 under the title *Dictionarium Grönlandico-danico-latinum*.

**EGER**, *ĕghĕr*: river of Austria. It rises 12 m. n.w. of the town of E, flows first s.e. to e., then in a general n.e. direction, passing Elbogen, Saaz, Birdin, and Theresienstadt, near which town it joins the Elbe, after a course of about 120 m. Its current is rapid, and no part of its course is navigable.

**EGER**: town of Austria, province of Bohemia, on a rock on the right bank of the river E., 90 m. w. of Prague, near the Bohemian frontier. Formerly, it was a border fortress of some importance; its walls, however, have been almost entirely pulled down, and its fosses filled up with rubbish. Among the conspicuous edifices of E. are its churches, of which there are four—one, the deanery church, very handsome; the market-place, within which is the large town hall; two monasteries, a Dominican and a Franciscan; and the barracks. East of the market-place is the house of the burgomaster in which Wallenstein was assassinated 1634. The ruins of the imperial burg or citadel, formerly the residence of kings and emperors, are in an angle of the fortifications above the river. From the midst of these ruins rises a singular square black tower, constructed of masses of volcanic tufa. The Double Chapel, consisting of two stories, the upper supported by graceful marble pillars, is a fine specimen of Gothic architecture. An avenue, nearly three m. long, leads from E. to Franzenbrunn (q.v.). E. has manufactures of broadcloth, kerseymeres, cottons, chintz, leather, soap, etc. Its industry and commerce have greatly increased since it became a point of junction of five railways. Pop. (1891) 18,658.

**EGERAN**, or **EGERANE**: same as **VESUVIANITE**.

**EGERIA**, *ĕ-jĕ'rĕ-ĕ*: in legend, the Nymph or Camena from whom King Numa received the ritual of public wor-



## EGERTON--EGG.

ship which he established in Rome. The grove where Numa met the goddess to receive her instructions was dedicated by him to the Camenæ. Roman legends speak of two groves dedicated to E.—one near Aricia, the other before the Porta Capena at Rome, where the grotto of E. is still shown.

EGERTON, FRANCIS: see BRIDGEWATER (Duke of).

EGERTON, FRANCIS HENRY: see BRIDGEWATER (Earl of).

EGESTA, n. *ĕ-jēs'tă* [L. *egestus*, voided or discharged—from *e*, out; *gĕrō*, I carry]: excrement; fæces; opposite of *ingesta*, the food taken in.

EGG, v. *ĕg* [Icel. *egg*, an edge; *eggja*, to sharpen, to incite (see EDGE)]: to urge on; to incite. EG'GING, imp. EGGED, pp. *ĕgd*: see AGG.

EGG, *ĕg*, or EGG, *ĕg*: island 12 m. off the w. coast of Inverness-shire, 8 m. s.w. of the s. point of Skye;  $4\frac{1}{2}$  m. long by  $2\frac{1}{2}$  broad. It consists chiefly of trap, which in the n. alternates with sandstone and limestone, the latter rocks containing oolitic fossils, carbonized wood, and coal. The Scur of Egg, in the s.w., rises 1,339 ft. The upper 470 ft. of this hill is a mass or vien of pitchstone,  $1\frac{1}{4}$  m. long, and 100 ft. broad. Some of the pitchstone forms straight, inclined, or curved columns, from a few inches to nearly two ft. in diameter. In one place, the pitchstone overlies red sandstone, conglomerate, trap, and the silicified wood of an oolitic pine. In the s. part of the isle is a large cave, entered by a narrow opening, through which only one person can creep at a time. Here it is traditionally related that the Laird of Macleod, to revenge an injury done to some of his clan, smoked to death all the inhabitants (200 Macdonalds) of the isle, who had hid themselves in the cave. Pop (1871) 282, (1881) 291; (1891) 233.

EGG, n. *eg* [AS. *æg*; Icel. *egg*; Dan. *æg*; Ir. *ugh*, an egg. OE. *eye*; Ger. *ei*, an egg]: a roundish body produced by the females of birds and certain other animals, out of which a creature is produced of a like kind; the spawn of fishes, etc. EGG APPLE. same as Egg-plant. EGG-BEARER, n. in bot., *Solanum ovigerum*. EGG-DETECTOR, n. an apparatus for showing the quality of eggs. They are placed upright in the holes in the lid of the dark chamber, and their transmitted light observed upon a mirror; their quality is determined by their translucency, as an egg becomes more cloudy and opaque as it becomes spoiled. EGG-FLIP, n. drink compounded of warmed ale, flavored with sugar, spice, spirit, and beaten eggs. EGG-GLASS, n. a glass for holding an egg while eating it; a sand-glass running about three minutes, as a guide for egg-boiling. EGG-MOLDING, n. in arch., a peculiar molding in which a tongue dependent from the corona alternates with an oval boss whose major diameter is vertical, like an egg set on end. EGG, MUNDANE: see MUNDANE EGG. EGG-NOG, n. a drink similar to egg-flip. EGG-SAUCE, n. sauce prepared with hard-boiled eggs, chopped up fine. EGG-SLICE, n. a kitchen

## EGG.

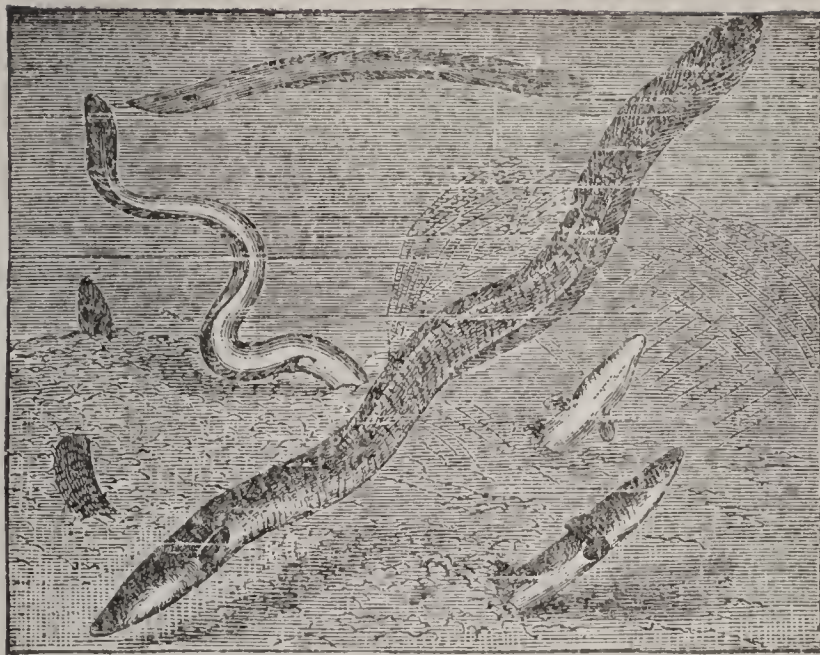
utensil or slice for removing fried eggs from the pan. **EGG-TROT**, n. slow jog-trot, such as one would adopt if carrying a basket of eggs. **FROM THE EGGS TO THE APPLES**, from first to last—in reference to the anc. Romans, who began their feasts with *eggs* and ended them with *apples*.—*Eggs* are usual products in the process of reproduction in a great majority of the different kinds of animals; in other words, the animals are *oviparous*. It is only in the *Mammalia* that we find animals truly viviparous; while the *marsupial* quadrupeds and the *monotremata* form connecting links, in this part of their natural history, between the *mammalia* which are viviparous in the fullest sense of the term, and the warm blooded animals (birds) which are oviparous.

The number of eggs varies extremely in different animals, some birds producing only one at a time, or in a year, others 20 or nearly that number, while the roe of the herring, cod, and many other fishes, contains myriads of eggs. The eggs of some animals are enveloped in a gelatinous mass; those of some are joined together, and are laid in a kind of string; those of others are connected together in various ways. For notice of such peculiarities, see the titles of different classes of animals.

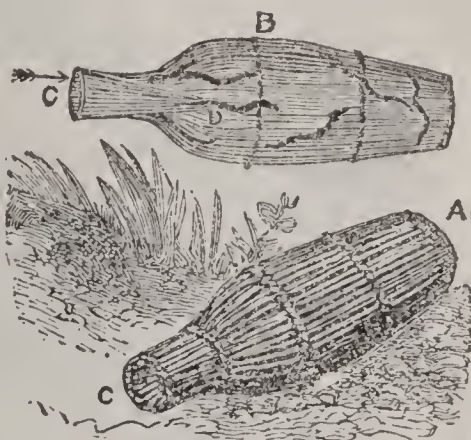
The economical uses of eggs are well known. The eggs chiefly used are those of birds, though the eggs of turtles also are in great repute as an article of food and luxury, and those of fresh-water tortoises are valued for the oil which they yield. The birds' eggs used for food are chiefly those of the species commonly domesticated as poultry, and others allied to them—gallinaceous birds and web-footed birds. Of gallinaceous birds, the common domestic fowl, the turkey, the pea hen, and the guinea-fowl, produce the eggs most generally used and brought to market in different parts of the world; of web-footed birds, the common duck is in this respect the most important, though the eggs of other *Anatidæ* also are used for food, and those of some of the other web-footed marine-birds are much sought by the inhabitants of the wild and rocky shores which they frequent. Thus, the eggs of gulls and guillemots afford an important article of food to the people of St. Kilda, and of some of the Orkney and Shetland Islands, as well as to the inhabitants of Iceland and other far northern regions. It is in quest of eggs, as well as of young birds, that the dangers of the most tremendous precipices are braved by men whom their companions let down by ropes, and who gather the eggs from the rock ledges. The coasts of Labrador also are visited by *egggers*, who collect the eggs of sea-birds, and carry them for sale to some American ports. The eggs of some of the sea-birds of the W. Indies are of considerable commercial importance. See **EGG-BIRD**.

*Chemistry of the Hen's Egg*.—An ordinary good-sized hen's egg weighs about 1,000 grains, of which the white constitutes 600 grains, the yolk 300, and the shell 100. The white or glaire of the egg is a strong solution of albumen (q.v.) in water, and while readily miscible with water in its ordinary state, it becomes insoluble when subjected to heat, as in boiling an egg. In 100 parts, the white or





The Common Eel (*Anguilla vulgaris*).



Eel-buck: A, Exterior; B, Section showing interior; C, Entrance; D, Eel entering the buck.



Framework with Eel-bucks,

## EGGA—EGG-BIRD.

glaire of egg consists of—water, 80; dry albumen,  $15\frac{1}{2}$ ; salts, etc.,  $4\frac{1}{2}$ . The yolk or yelk of the egg is composed of a strong solution of albumen, through which multitudes of minute globules of oil are suspended, which render it essentially an emulsion. In 100 parts, it consists of—water,  $53\frac{3}{4}$ ; dry albumen,  $17\frac{1}{2}$ ; oil (with small proportion of salts),  $28\frac{3}{4}$ .

EGGA, *ěg'gâ*: large town of w. Africa, Yaruba country, on the right bank of the Niger, lat.  $8^{\circ} 43'$  n., long.  $6^{\circ} 20'$  e. It is said to be two miles long. Its streets are narrow; the houses are principally huts built of clay, the walls smooth, and stained with indigo. Great quantities of narrow cotton cloth, only a few inches in breadth, and generally dyed blue, are manufactured here. The inhabitants are enterprising and commercial, many of them possess canoes, in which they trade up and down the Niger. These canoes are covered by a sort of shed, under which the traders sleep at night. The chief articles of trade are beautifully carved calabashes, cloth net-work, corn, yams, sweet potatoes, dried fish, and a few European articles, as beads and gunpowder. The population, from 10,000 to 15,000, is partly Mohammedan and partly pagan.

EG'GAR MOTH: name of certain species of moth, of the genus *Lasiocampa*, allied to the silk-worm moths. One species (*L. trifolii*), of a uniform foxy ochreous color, with



Eggar Moth and Caterpillar (*Lasiocampa trifolii*).

wings expanding about two inches, produces a caterpillar as thick as a swan's quill, hairy, and ochreous brown, which feeds sometimes on broom, but frequently in clover-fields.

EGG'-BIRD (*Hydrochelidon fuliginosum* or *Sterna fuliginosa*): bird of the gull family, called sometimes the SOOTY TERN. It is fully larger than the common tern of the



## EGGLESTON.

on U. S. shores; has a long, slender, nearly straight, compressed, sharp bill; very long, narrow, and pointed wings, and a long deeply forked tail; the general color is glossy black on the upper parts, except the forehead and the edges of the wings, which, with the under parts, are white. It abounds in the W. Indian seas, and is to be seen in myriads on and near some of the *keys* or low barren islets where it breeds. When visitors land on these keys, the disturbed birds rise and fly about in clouds which darken the air, while their turmoil overpowers even the roar of the breakers. The nest of the E. is merely a little excavation in the sand, and usually contains three eggs, which are fully two inches long, of a pale-cream color, sparingly marked with light-brown and purple tints. The eggs are esteemed delicious, and form an object of profitable adventure in the months of March, April, and May, to the crews of numerous small vessels, fitted out from Kingston, Havana, and other W. Indian ports. Curious customs



Egg-Bird, or Sooty Tern (*Hydrochelidon fuliginosum*).

prevail among the egg-gathers at the most frequented keys, and common consent has established a kind of code of laws among them. The eggs remain fresh and fit for use only a short time. With the eggs of the E., those of the Noddy are also gathered, and those of the Sandwich Tern and other allied species; and the name egg-bird, with some prefix, is sometimes extended in the W. Indies to several of the terns.

EGGLESTON, ěg'gělz-ton, EDWARD, D.D.: author: b. Vevay, Ind., 1837, Dec. 10. He was self-educated, became a circuit preacher of the Meth. Episc. Church 1856, and held several pastorates in Minn. till 1866, when he was appointed asst. editor of the juvenile paper *Little Corporal*, and removed to Evanston, Ill. In 1867 he went to Chicago, where he edited the *Sunday School Teacher*, and contrib-

## EGGLESTON—EGG-PLANT.

uted to the New York *Independent* for 3 years, and then became literary editor of the latter. He succeeded Theodore Tilton as superintending editor of the *Independent*, was editor of *Hearth and Home* 1871-2, and pastor of the Church of Christian Endeavor (Congl.), Brooklyn, 1874-79, and subsequently applied himself to literature. He published *Mr. Blakē's Walking Stick* (1869), *Book of Queer Stories* (1870), *The Hoosier School-master* (1871), *End of the World* (1872), *Mystery of Metropolisville* (1873), *The Circuit Rider* (1874), *Christ in Literature* (1875), *Christ in Art* (1875), *Roxy* (1878), *The Hoosier School boy* (1883), *The Faith Doctor* (1891), *Duffels* (1893), *Tecumseh and the Shawnee Prophet* (1878), *Pocahontas and Powhatan* (1879), *Brant and Red Jacket* (1879), *Montezuma and the Conquest of Mexico* (1880), *A First Book in Amer. History* (1889), *The Story of Washington* (1893). He died 1902, Sept. 2.

EGGLESTON, GEORGE CARY author; b. Vevay, Ind., 1839, Nov. 26; brother of Edward E. He was educated at Ind. Asbury Univ. and Richmond (Va.) College, taught school, studied law and practiced in Va., served in the Confederate army through the civil war, was a reporter and editor on the Brooklyn *Union* 1870-1, succeeded his brother as editor of *Hearth and Home*, was literary editor of the New York *Evening Post* 1875-81, and became editor-in-chief of the New York *Commercial Advertiser* 1886, Jan. He has contributed frequently to magazine literature and published numerous books, of which *A Rebel's Recollections* (1874), and the American edition of *Haydn's Dictionary of Dates* (1883) are best known.

EGG-PLANT (*Solanum Melongena*); tender annual, culti-



Egg-plant (*Solanum*):  
A, purple variety; B, white variety.

vated for its fruit which grows in the form of an egg, two to five or more inches in diameter. It is one of the most



## EGG-TRADE—EGINHARD.

difficult to raise of all our garden plants. In the Middle and Northern States the seed should be sown in a hot-bed about the middle of April. The first week in June is usually as early as it is safe to transplant. The soil must be very rich. Plants should be set at least two and a half ft. apart. They should be shaded and watered for a few days and need careful cultivation during the summer. Mulching is beneficial both by retaining moisture in the soil and by keeping the fruit from the ground. The most formidable enemy is the Colorado potato beetle which must be fought during the entire season. There are several varieties yielding fruit of different colors and varying degrees of excellence. The New York Improved, a purple sort, and the Black Pekin are among the most desirable for market. In American cities and villages the fruit finds a ready sale as a delicacy, while in tropical countries it forms an important article of food.

EGG-TRADE: important branch of business in the United States and England. Although immense quantities of eggs are produced in the United States, the supply always falls very far short of the demand, and the deficiency is made up by importations from other countries. They are a staple article of trade and are regarded as good as cash at almost every country and village grocery. All not wanted for home consumption are sent to the large towns and cities, where, if in good condition, they always find ready sale. New York city alone uses not less than five hundred million eggs per year. They are forwarded in barrels, each of which holds 70 dozen. The price fluctuates greatly, being nearly twice as high in winter as in summer, due to the largely increased supply at the latter period. Very few eggs are sent abroad, but the number of those imported averages about two million dozen per year, and sometimes largely exceeds this sum. About three-fourths of the imported eggs come from Canada, but from two to three hundred thousand dozen per year are brought from China to the Pacific coast. The average annual consumption in this country is about nine dozen for each person. England also imports large quantities of eggs, most of which are obtained from France, though many are supplied by more distant countries. There are various processes for preserving eggs by the use of lime, salt, or chemicals, so that they will remain good for several months. When eggs are very plenty large numbers are preserved which are kept until prices rise.

EGHAM, *ĕg'am*: village in the n.w. of Surrey, Eng., on the right bank of the Thames, 18 m. w. of London. In the vicinity is Runnymede, a meadow on the Thames, where King John conferred with his barons before signing the Magna Charta 1215. Near also is Cooper's Hill, rendered famous by Denham and Pope.

EGINA: see *ÆGINA*.

EGINHARD, *ĕg'in-hârd*, or EINHARD, *ĭn'hârt*: biographer of Charlemagne: born toward the end of the reign of Pipin, or the beginning of that of Charlemagne; d. 840.

## EGLANTINE—EGLINTON.

Mar. 14. At an early age, he repaired to the court of the latter monarch, and became a pupil of Alcuin. His talents and acquirements gained him the favor of the emperor, who appointed him his private secretary, and superintendent of public buildings. E. accompanied the emperor in all his marches and journeys, never separating from him except on one occasion, when he was dispatched by Charlemagne on a mission to Pope Leo. On the death of the emperor, he was appointed preceptor to Lothaire, son of Louis le Débonnaire, and for a number of years afterward appears to have been lay abbot of various monasteries; but ultimately becoming tired of secular life, he retired to the secluded town of Mühlheim. Here he erected a monastery, and changed the name of the place from Mühlheim to Seligenstadt (City of the Blessed). He is said to have now become a monk, but this is scarcely authenticated. E. was buried beside his wife who died 836, and the two coffins are now shown in the chapel of the castle at Erbach. The counts of Erbach trace their descent from Eginhard. His *Vita Caroli Magni*, completed about 820, with respect to plan and execution, as well as language and style, is incontestably the most important historical work of a biographical character that has come down to us from the middle ages. It was frequently used as a school-book, and was therefore copied *ad infinitum*. The best German edition is that of Pertz, in the *Monumenta Germaniæ Historica*. His *Epistolæ*, 62 in number, also are of considerable value in a historical point of view. The French consider the edition of E.'s works by M. Teulet, with a translation, and life of E. (1848), to be the best and most complete. E.'s second work, the *Annales Regum Francorum, Pippini, Caroli Magni, Hludowici Imperatoris*, embraces the period 741 to 829. According to a pretty legend, E.'s wife, Emma, was a daughter of Charlemagne. A mutual affection had arisen between them, and on one occasion when the lovers were enjoying a nightly interview, a sudden fall of snow covered the spacious court, thus rendering retreat impossible without leading to a discovery. As the traces of female footsteps could not excite suspicion, Emma carried her lover across the court on her shoulders. This scene, it is said, was observed from a window by Charlemagne, who united the affectionate pair in marriage. On this legend Fouqué founded his romance of *Eginhard and Emma*, and Longfellow has made it the subject of a short poem.

EGLANTINE, n. *äg'län-tin* [OF. *aiglantine*; F. *églantier*, the dog-rose—from *aiglent*, a thorn—from mid. L. *aculen'tus*, prickly: Prov. *aguilen*, a hawthorn]: a plant covered with *aiglents* or thorns; the OE. name for the sweet-brier; applied sometimes to other of the smaller flowered species of rose; used for 'columbine' or 'honey-suckle' in Milton.

EGLINTON, *äg'lîn-ton*, AND WINTON, *wîn'ton*, ARCHIBALD WILLIAM MONTGOMERIE, Earl of, K. T.: 1812-61; b. Palermo: twice lord-lieut. of Ireland. He was a well-known patron of the turf and field-sports, and his name is



## EGMONT.

particularly associated with a splendid revival of the mediæval tournament, which he gave at Eglinton Castle 1859 (see **TOURNAMENT**). Lord E. was at various times lord-lieut. and sheriff-principal of Ayrshire, lord rector, and dean of the faculty of Glasgow Univ., etc.

EGMONT, *ĕg-mōng'*, LAMORAL, Count, Prince of GAVRE: 1522–1568, June 4; b. in the castle of La Hamaide, in Hainault. He inherited his property and titles from his elder brother Charles. He accompanied Charles V. on his expedition against Algiers 1541, and followed that monarch afterward in all his campaigns, but without distinguishing himself greatly. After the accession of Philip to the throne, E. commanded, with great success, the cavalry, in the battle of St. Quentin 1557, and next year in that of Gravelines; and when Philip finally returned to Spain, he left E. gov. of Flanders and Artois. In this position, E. entered into alliance with the party in the Netherlands that were dissatisfied with the Rom. Cath. policy of Philip, and from a courtier became all at once a man of the people. His proud, imperious character, however, and his subsequent conduct, have induced many to suppose that, like his bosom-friend the Prince of Orange, he was actuated in this less by high motives than by self-interest, or at least by disappointed ambition. The more common opinion, however, is, that he was a humane and virtuous patriot, who, though indifferent to Protestantism as a religion, was anxious to do justice to all the members of that oppressed faith. When Margaret, Duchess of Parma, against the will of the Prot. party, was made regent-gen. of the Netherlands, E. and the Prince of Orange entered the council of state, and held the command of the few Spanish troops. At first he sided with the party who were discontented with the infringement of the liberties of the provinces, and the introduction of the inquisition; but when insurrections broke out, he at last broke with the Prince of Orange and the 'Beggars' League,' as it was called. He seemed to have restored order, and to be maintaining it, when 1567, Apr., the Duke of Alba was sent as lieut.gen. to the Netherlands. The Prince of Orange and other chiefs of the insurrection left the country; E., wishing to save his private property, remained, thinking his return to the court had secured his safety. When Alba entered Brussels, Aug. 22, E. went to meet him, and sought to secure his favor by presents. He appeared to have gained his confidence, when suddenly after a sitting of the council, he and Count Hoorn were treacherously seized and carried to the citadel of Ghent. The states of Brabant sought to withdraw E. from the bloody tribunal, as it was called, instituted by Alba, and E., as a knight of the Golden Fleece, denied its competency. But all in vain. He was called upon to justify himself against 90 counts of accusation; and as he persisted in protesting against the incompetency of the court, and thus left many of the points unanswered, he was held guilty of contumacy, and along with Count Hoorn condemned to death. On the following day, 1568, June 4, they both

## EGMONT—EGRET.

were beheaded in the market-place of Brussels. Although E. hoped for pardon to the last, and intercession was made for him from the highest quarters, he died with the greatest composure. It is related that as he received the fatal stroke, Johanna Laval, who had been his mistress, fell down dead, and the people, in a paroxysm of sympathy, dipped handkerchiefs in the blood that seemed shed in martyrdom to freedom. E. left 11 legitimate children, of whom three were sons. The whole of his property, movable and immovable, was confiscated with the greatest rigor. See *Correspondance de Marguerite d'Autriche, Duchesse de Parma* (Bruss. 1842), and *Correspondance de Philippe II. sur les Affaires des Pays-Bas* (Bruss. 1848-51, 2 vols.). Goethe has made the death of E. the subject of a tragedy.

**EGMONT**, *ĕg'mōnt*, **MOUNT**: active volcano of New Zealand, on the northerly island of its own group, rising 8,340 ft. above the sea. It is 18 m. s. of New Plymouth; lat. 39° 15' s., long. 174° 13' east.

**EGMONT, PORT**: principal harbor of the Falkland Isles, on the n. coast of the more westerly of the principal two islands of the group, its seaward barriers being the islets of Keppel and Saunders. It is in lat. 51° 21' s., and long. 60° w. The anchorage is good; and the shores afford fresh water, but are almost destitute of wood.—Several other unimportant places have the name Egmont.

**EGO**, n. *ĕ'gō* [L. *ego*, meaning I; Ger. *ich*; Dan. *jeg*; Sw. *jag*; AS. *ic*, I]: the thinking subject, whatever it may be—all beyond being *non-ego*. **EGOISM**, n. *ĕ'gō-īzm*, the doctrine of those who believe everything uncertain but their own existence. **E'GOIST**, n. one who believes nothing certain but his own existence. **EGOTISM**, n. *ĕ'gō-tīzm*, a speaking, writing, or thinking much of one's self. **EG'OTIST**, n. one who writes or speaks much of himself. **EG'OTIZE**, v. *-tīz*, to exalt one's self. **EG'OTIZ'ING**, imp. **EG'OTIZED**, pp. *-tīzd*. **EG'OTIS'TIC**, a. *-tīs'tik*, or **EG'OTIS'TICAL**, a. *-tī-kāl*, given to egotism; self-conceited. **EG'OTIS'TICALLY**, ad. *-lī*.—**SYN.** of 'egotistical': opinionated; selfish; conceited; vain; self-important.

**EGRANULOSE**, a. *ĕ-grăn'ū-lōs* [L. *e*, without, and Eng. *granules*]: in *bot.*, without granules.

**EGREGIOUS**, a. *ĕ-grĕj'jī-ūs* [L. *egrĕgiūs*, singular, notable—from *ex*, out of; *grĕgem*, a flock]: unusual; remarkable; distinguished, in a bad sense; enormous. **EGRE'GIOUSLY**, ad. *-lī*. **EGRE'GIOUSNESS**, n. the state of being remarkable and unusual.—**SYN.** of 'egregious': monstrous; extraordinary; distinguished.

**EGRESS**, n. *ĕ'grĕs* [L. *egressus*, a departure—from *ex*, out of; *gressus*, a step, a course: It. *egresso*]: a going out; power or act of going out; departure. **EGRES'SION**, n. *-grĕsh'ūn*, the act of going out.

**EGRET**, n. *ĕ'grĕt* [F. *aigrette*]: a small white heron; name often given to various species (usually smaller white species) of heron (q.v.), particularly those which, at least during the breeding season, have the feathers on the lower part of the back lengthened and their barbs loose, so that



## EGRIOT.

this part of the plumage is very soft and flowing. Most of the egrets have beautiful white plumage. The distinction between egrets and other herons is not strongly marked, and the names are often used indiscriminately, though the name E. is never given to the common heron. E. plumes are used for ornamental purposes, particularly the occipital crest and scapulars of the LITTLE E. (*Ardea garzetta*); and the name E. (Fr. *aigrette*) has become a common term for a tuft of feathers, though it is said to be derived from the



Little Egret (*Ardea garzetta*).

French *aigre*, harsh, on account of the harshness of the bird's voice. In old English bills of fare, egrets are mentioned as if they were abundant; and not fewer than 1,000 'egrittes' are included in the bill of fare of a single great feast, given at the enthronization of George Neville, Abp. of York, in the reign of Edward IV.; but as there is no other evidence that any species of E. was ever otherwise than of very rare occurrence in Britain, great probability attaches to the opinion originally advanced by Dr. Fleming that perhaps the lapwing might be meant, 'the most common bird with a crest.'

EGRIOT, n. *ě'grĭ ōt* [F *aigret*—from *aigre*, sour—from L. *acrem*, sour]: a species of sour cherry; the wild cherry.

## EGYPT.

EGYPT, *ē'jpt*: country in n.e. Africa, extending from the Mediterranean to the first cataract of the Nile, at Assouan, from lat.  $24^{\circ} 6'$  to  $31^{\circ} 36'$  n. The name is derived from the Greek *Aigyp̄tos*, either meaning the Coptic land, or as some maintain, derived from *Hakaptah*, 'the city of Ptah,' i.e., Memphis (according to Maspéro). In Hieroglyphs and Coptic, it was called *Kemi* (Black Land), from the color of the soil; and by the Hebrews *Mazor* or *Mizraim*,



Egypt.

modified by the Assyrians into *Musr*, and by the Persians into *Mudraya*. The country may be described as the bed of the Nile, the cultivated territory extending only to the limits of the inundation. This river runs from the cataracts of Assouan, in a northerly direction, to Denderah, where there is one great bend to the w.; and a few m. n. of



## EGYPT.

Cairo (lat.  $30^{\circ} 15'$  n.), the river divides into two main streams, forming the Rosetta and Damietta branches. The other five mouths, which existed in antiquity, have silted up; the alluvial district inclosed by these mouths, and supposed by the ancients to have been gained from the sea, formed the ancient Delta. The basin of the Nile is formed by the ranges of the Arabian hills on the e., and the Libyan on the w. side. The rate of deposit of mud is supposed to be about  $4\frac{1}{2}$  inches in a century. The e. chain of mountains rises to about 1,000 ft. above the level of the sea. The great physical peculiarity of Egypt is the absence of rain, the land being irrigated only by the annual overflow of the Nile. The climate is remarkably mild and sound, especially s. of the Delta; and in the desert, from Cairo to Alexandria, the air contains more moisture than to the south. From the middle of Aug. to Dec., w. winds prevail; e. winds from Dec. to Mar.; after that, unhealthful s. winds or Khamsin till June; and from June to Aug. the n. or Etesian winds. Earthquakes are occasionally felt; and the temperature varies from  $84^{\circ}$  F. to  $32^{\circ}$ . The most remarkable phenomenon is, however, the regular increase of the Nile, fed by the fall of the tropical rains, which commence in  $11^{\circ}$  n. lat., in the spring; and falling first into the White, and then Blue Nile, reach Egypt in the middle, and the Delta in the end of June. In the middle of July, the red water appears, and the rise may be dated from that time; it attains its maximum at the end of Sep., and begins to decline visibly in the middle of Oct., and subsides to its minimum in April. At the end of Nov., the irrigated land has dried, and is sown, and is covered with green crops, which last till the end of February. In March is the harvest. The state of the Nile, in fact, marks the season more accurately than the variation of temperature. E. is not remarkably healthy, as, in addition to the visitations of plague and cholera, ophthalmia, diarrhœa, dysentery, and boils often prevail, and European, and even Nigritic races cannot be acclimatized.

*Geology.*—E. is separated from Nubia by a low hilly region about 50 m. broad from n. to s., composed of granitic rocks. The same crystalline rocks extend up the shore of the Red Sea to near the opening of the Gulf of Suez, stretching inland for fully 30 m. The scenery in this district is wild and rude, and the course of the Nile is frequently interrupted by cliffs and broken masses of granite, forming magnificent cataracts. The granitic region terminates at Assouan, the ancient Syene. From the rocks here were obtained the materials for the colossal and monolithic monuments of Egypt. The valley of Upper Egypt is bounded by two ranges of hills running northward—the Arabian range on the right, the Libyan on the left of the river, both alike composed of cretaceous strata, the predominant rock being sandstone. This is a durable and easily worked stone, and was consequently extensively used in the erection of ancient temples. The city of Thebes was built of it. The cretaceous sandstone extends from the granitic rocks forming the first cataract at Assouan for

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about 85 m. to Esné, where it is covered by a limestone belonging to the upper chalk series. This continues on both sides of the valley for about 130 m., when it is covered by a tertiary mummulite limestone, which forms the farther prolongation northward of both ranges of hills. Because of the easy disintegration of these beds, the scenery in the limestone districts is tame and monotonous; frequent table-lands occur, on one of which are built the three pyramids of Gizeh, the material employed being the predominant limestone.

Over a large extent of E., these rocks are covered with moving desert sands, and in the flat lands bordering the Nile, with the alluvium brought down by its waters, and which has formed the Delta at its mouth. This alluvium consists of an argillaceous earth or loam, more or less mixed with sand, and a quartzose sand probably derived from the adjacent deserts by violent winds. It is remarkable that this sedimentary deposit has no traces of stratification, and also that within short distances, great varieties are observed in what are apparently synchronous deposits. In late years more careful observation of the Nile deposits, with the striking conclusions that have been deduced therefrom, have drawn increased attention of geologists to these deposits. See MEMPHIS.

*Natural History and Productions* — The fertile valley of the Nile and the desert regions which inclose it, are very different, not only in their botany, but in their zoology. One of the most notable of Egyptian quadrupeds is the hippopotamus, which formerly reached the Delta, but is now seen only in the more southern parts of the Nile. The giraffe is occasionally found within the southern borders of Egypt. The jackal and hyæna are common; also the ichneumon (q.v.), so much celebrated among the ancients; and the jerboa. The one-humped camel was introduced by the Ptolemies for the transit of the Indian trade. The other usual domestic quadrupeds have existed from most ancient times. Of domestic birds, water-fowl were anciently most numerous; the gallinaceous poultry now common not being probably of older date than the Persian invasion. Pigeons have always been abundant. The Egyptian vulture (q.v.) is a common and notable bird, as is also the ibis (q.v.), held sacred by the ancient Egyptians, and of which many fables have been related. The ostrich sometimes occurs in the desert. Of reptiles, the most famous is the crocodile of the Nile; monitors (q.v.) are also abundant, saurian reptiles of considerable size. Smaller lizards abound. The trionyx, or soft tortoise, is plentiful in the Nile. Serpents are numerous; among the most venomous and dreaded of which are the asp (q.v.) or haje, and the cerastes (q.v.). E. abounds in fish, the most remarkable being the binny (see BARBEL), the *Latus* (one of the perch family), the Bayad or *Silurus*, the *Chromis Nilotica*, and the *Mormyrus oxyrhynchus*. The sacred beetle (*Scarabæus sacer*) is one of the most remarkable insects. Locusts are a dreaded pest. E. is still notable also for the abundance of the other creatures mentioned by Moses as its plagues. —



## EGYPT.

Many of the European trees and plants are found in E.; the date-palm, the doom-palm the sycamore, acacias, tamarisks, etc., are among its more peculiar botanical productions; also the papyrus (*p-apu*), which anciently supplied material for paper, and the lotus (*shnin*) or water-lily of the Nile. The extensive culture of papyrus has been, in modern times, replaced by that of the sugarcane, cotton, indigo, and tobacco; and the papyrus has almost disappeared. Gourds and melons have always abounded. To the wheat and barley of antiquity have been added maize and durra. E. is very deficient in timber trees; the Pharaohs obtained cedar from Lebanon and ebony from Ethiopia. The rocks of E. afforded the stones used in its edifices and sculptures; granite, syenite, basalt (at Assouan), breccia (in the Cosseir Rood), porphyry (from the quarries of Gebel Doshan, opened in the reign of the emperor Claudius), sandstone, and limestone. Alabaster (found at Tel-el-amarna) has been used from the earliest periods to the present day. Emeralds are produced by the mines of Gebel Zabara; salt, natron, and—since 1850—sulphur are among mineral productions of Egypt.

*Divisions.*—The country was anciently divided into 44 nomes—22 in Upper, and 22 in Lower Egypt. Each nome or dept. had a separate local municipal government of a nomarch or lieut.gov., *ha*, besides governors of the cities, of the temples, scribes, judges, and other functionaries. Their limits were measured and defined by landmarks. This division, as old as the 4th dynasty, varied in number at different times. Under Sethos I. or Sesostris, there were 36 nomes—10 in the Thebaid, 10 in the Delta, and 16 in Middle Egypt. At the time of the geographer Ptolemy, there were 47—the Antinoits having been added. The country beyond the cataracts to Hierosycaminos was named at the Roman period Dodekaskoinos. In A.D. 400 Egypt was divided into Augusta Prima and Secunda on the e., and Ægyptiaca on the w., the Heptanomis as far as Oxyrhynchus was named Arabia, then Thebais Proxima as far as Panopolis, and Thebais Supra to Philæ. Under the Arabs, E. has been divided into Masr-el-Bahri or the Delta; the Faioum, El Bostani, or Middle Egypt; and Es Said or Upper Egypt, Nubia, Darfur, and extensive territories on the Upper Nile, extending to the Victoria Nyanza in central Africa, were 1876–82, subject to the khedive. See SUDAN.

For a description of the most remarkable antiquities of E., see ABOUSAMBUL: ALEXANDRIA: EDFOU: MEMPHIS: THEBES: also NILOMETER: OBELISK: PYRAMID: etc.

The *population* of the country must have been large at the earliest period, as 100,000 men were employed in the construction of the Great Pyramid alone during the 4th dynasty. It has been placed at 7,000,000 under the Pharaohs, distributed in 1,800 towns, which had increased to 2,000 under Amasis, B.C. 525, and upward of 3,000 under the Ptolemies. In the reign of Nero, it amounted to 7,800,000. The pop. (1844) was 2,500,000; (1859) 5,125,000; and (1879) including Nubia, Darfur, and other dependencies, nearly 17,000,000, of whom 5,200,000 inhabited Egypt proper.

## EGYPT.

The great bulk of the inhabitants consist of native Moham-medans; the Copts (q v.) are estimated at 150,000, and the rest are composed of Bedouin Arabs, Negroes, Abyssinians, Turks, Syrians, Greeks, Armenians, Jews, and Western Europeans. The original population appears, both from the language and from the physical conformation of the mummies, to have been of Asiatic origin, afterward blended with Ethiopian by subsequent irruptions and conquests; but there appears to have been an aboriginal race at an early period, of copper color, fair proportioned, though with rather thin legs, large feet, rather high cheek-bones, and large lips. According to Herodotus, Diodorus, and Plato, the system of castes prevailed in Egypt. The first of these authors says there were seven castes—of priests, warriors, cowherds, swineherds, innkeepers, interpreters, and pilots. Diodorus makes only five—priests, soldiers, cultivators, shepherds, and artisans; and Plato the same. The evidence of the monuments, however, shows that these were rather conditions of society than castes, as the different orders not only intermarried, but even, as in the case of priests and soldiers, held both employments. As in all bureaucracies, the sons often obtained the same employments as their fathers.

*Religion.*—The Egyptian religion was a philosophical pantheism, the various attributes of the Deity being divided among the different gods of the Pantheon. Unlike the Greek, where a god was honored in a separate temple, each Egyptian divinity was accompanied by a *put* or ‘company’ of companion-gods. The principal nomes and cities had each a family group of gods, consisting of a parent deity, a wife and sister, and a son. Thus Ptah or Hephæstus, the eponymous and principal god of Memphis, formed a triad with the goddess Sekhet (fig. 1), or Bast, and Imhotep: at Thebes the triad was Amen-ra, Mut, and Khons; and at Apollinopolis Magna, Harbahud (Horus) Hathoe, and Har-pakhrut (Harpocrates). These triads were often accompanied by inferior deities: and personifications of the elements, passions, and senses, and feelings were introduced. The worship of some triads, however, became universal—that of Osiris, Isis, and Horus being found all over Egypt at the earliest



Sekhet.

period. The gods, indeed, are stated by the Greeks to have been divided into three or more orders. The first contained seven (or nine); the second, twelve; the third, an unknown number. The gods of the first order were Ptah, Ra, Shu, Seb, Osiris, Set or Typhon, and Horus, according to the Memphite; and Amen, Mentu, Atum, Shu, Seb, Osiris, Set, Horus, and Sebak, according to the Theban version. Great uncertainty prevails about the gods of the second and third order, and still greater difficulty about the gene-



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sis and nature of the gods, different doctrines prevailing at different times and places; and the tendency to fuse different gods into one, particularly at a later period: Amen Ra, for example, being identified with Horus; and Horus, Ra, Chnum, Mentu, and Tum being merely considered the sun at different periods of his diurnal course. Very little light is thrown on the esoteric nature of the deities by the monuments, and the classical sources are untrustworthy; but the antagonism of good and evil is shown by the opposition of the solar gods and the great dragon Apap, a type of darkness, and the hostility of Osiris and Set or Typhon. Some of the gods were self-existent, others emanated from a father, some were born of a mother only, others were the children of greater gods. Their energies and powers differed, and their types, generally with human bodies, have often the heads of the animals which were their living emblems, instead of the human. A few foreign deities became at the close of the 18th dynasty ingrafted into the religious system—as *Bar*, Baal; *Ashtarata*, Ashtaroth; *Anta*, Anaitis; *Ken*, Kiun; *Reshpu*, Reseph; *Set*, Satan. All the gods had human passions and affections, and their mode of action was material; they walked on earth, or sailed through ethereal space on boats. The principal deities are Ptah, the opener, represented as a bow-legged dwarf or fœtus; the Phœnician Pataikos, the creator of the world; the sun and moon, out of chaos (*ha*) or matter (*Mu*), to whom belong Pasht, ‘the lioness,’ and Bast, Bubastis, lion-headed goddesses presiding over fire, and Nefer Tum, his son, a god wearing a lotus over his head. Next in the cosmic order is Khnum—worshipped at Elephantine—the ram-headed god of the liquid element, who also created the matter of which the gods were made; and connected with him are the goddesses Heka the Frog, or primeval formation, Sati, or ‘sun-beam,’ and Anuka, alluding to the genesis of the cosmos. The Theban triad comprised Amen-ra, ‘the hidden’ power of the sun, the Jupiter; *Mu*, the ‘Mother’ goddess or ‘Matter,’ the Juno; *Nit*, the ‘Shuttle,’ the Minerva; and Khous, ‘Force’ or Hercules, a lunar type. A subordinate type of Ammon is Khem, ‘the enshrined,’ who, as *Harnekht*, or Powerful Horus, unites beginning and end, or cause and effect. The solar worship comprises *Ra*, the Sun, who, traversing the ‘*sba*, or empyreal space of Gates, passes each hour a separate region, and as he descends behind the west hills of the horizon, becomes Atmu, also a demiurge; while as Mentu, a hawk-headed god, he is Mars, and as Khepra, a scarab-headed god, the male creative or existent principle, and is identified with Amen, Khnum, and other deities. Day and night, Ra and his satellites pursue the Apap or ‘Giant’ Dark-



Amen-ra.

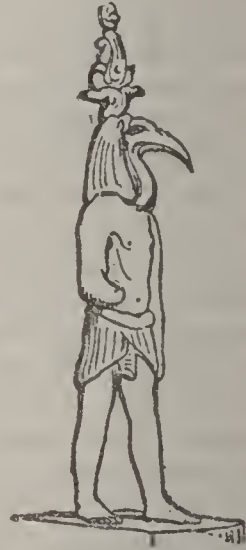
‘Giant’ Dark-

## EGYPT.

ness with alternate success. The souls of the blessed come off from earth, and entering the boat of Ra, there enjoy the perpetual streams of light which emanate from his orb. From *Ra* or Helios spring Shu and Tef the Gemini, Athor and Ma. *Seb* or 'Time,' and *Nu* or the 'Firmament,' gave birth to Osiris, Isis, Nephthys, Set, and the elder Horus, a group of terrestrial and infernal deities. The myth of Osiris destroyed by his brother Set, hewn in pieces, recovered by Isis, and avenged by Horus his son, embalmed by Anubis and the genii of the dead, and de-



Anup, or Anubis.



Thoth.

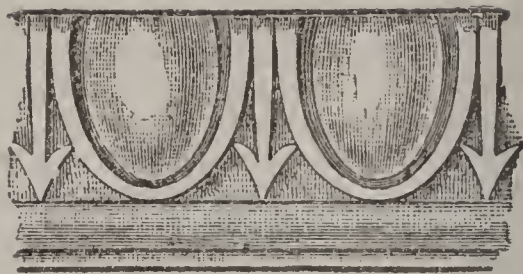
fended by Thoth, the Egyptian Hermes, at the 'great judgment' before his accusers, Set and the conspirators, was the type of the judgment and future destiny of man, and all deceased were called by his name: see OSIRIS. Numerous inferior deities, such as Hapi, the Nile, appear either as other forms of the superior deities or local varieties of the myths. Each deity had his sacred animal, which received a local worship, and which was considered to be the 'second life' of the deity it represented. The special animal selected was installed in the adytum of the temple, and gave oracular responses. The most remarkable of these animals was the Apis bull of Memphis, whose worship had a national extension. The Egyptians believed in the transmigration of souls, and all not sufficiently pure to be admitted into the courts of the sun, or whose bodies had perished before the expiration of 3,000 years, passed from body to body (see EMBALMING), having first descended to the Hades, and passed through the appointed trials and regions, endeavoring to reach the manifestation to light. In this progress, the soul was required to know and tell the names of the doors, regions, and their guardian demons through which it had to pass.

*Ancient Civilization.*—It remains to consider the old civilization of the Egyptians, which had made such strides at an early period of their history. In the sciences, as early as the 4th dynasty, the notation of time, the decimal system of numbers, weights and measures adjusted to a pound of



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1,400 grains, the geographical division of the country, and the division of the year (of 365 days) into three periods (each of four months of 30 days) and twelve months, were already known, while the form of the buildings implies a knowledge of geometry and its sister sciences. An empirical knowledge of astronomy was probably possessed; nor could the arts have reached such high development without some acquaintance with chemistry; and tradition assigns a knowledge of medicine and anatomy to a still earlier age. The art of literary composition also existed in the 11th dynasty, for fragments of the religious or so-called Hermetic books of that age have reached us (see PAPHYRUS); and Cheops himself was an author of renown. The language of the period, though concise and obscure, was nevertheless fixed; and a code of manners and morals, under the 6th dynasty, has been handed down. For the language of E., see COPTIC: COPTS: HIEROGLYPHICS. Architecture had attained great refinement at an early period; not only were the chambers and temples, and other edifices, squared and directed to face the cardinal points, but the use of a kind of false arch, or stones disposed so as to form an angle overhead to relieve superincumbent pressure, *en décharge*, was practiced as early as the 4th, and the vault or arch was in existence in the 11th and 18th dynasties, eight centuries before that of the Cloaca Maxima of Rome. Columns were in use as early as the 4th dynasty; and in the 12th, the so-called proto-Doric columns of Beni-hassan, with their cornices and triglyphs, show that the Greeks derived this order of architecture from Egypt. The symmetric arrangement of the temples, consisting of rectangular court-yards and hypæthral halls of many columns, built before the original shrine, with their gateways slightly converging to the apex, and their bold and severe lines, and the obelisk (see OBELISK), and the pyramid (see PYRAMID), forms admirably adapted to resist the inroad of time, in addition to the remarkably fine masonry, prove the high development which this art had acquired at the remotest age. Nor was sculpture less advanced, for long before Dædalus, the statues of the 4th dynasty, at least B.C. 2000, had been molded with great accuracy to a fixed canon; and though Egyptian architectural employment had rendered their action rectilinear—such as the arms pendant, the left foot advanced, and the feet not detached but when in stone, with the part between them reserved—and the ears were placed too high in the head, and a kind of pillar was fixed behind in standing figures, yet in portraiture they had attained great perfection. Sculpture, indeed, in the human form was always restricted to a few conventional attitudes; but some of the lions and sphinxes are executed with a spirit surpassing the power of Greek artists. A peculiar kind of bas-relief prevailed in E., the figures being sunk below the surface like the intaglio figures of a gem, but in slightly convex relief, not concave. This style, called *cavo-rilievo*, or intaglio, has been most successful in preserving the hieroglyphs and anaglyphs of the monuments. Bronze statues cast from molds, and having a leaden or other core, were first made in E., and subsequently intro-



Egg-molding.



Egypt.—Sacred Bark.



Egypt.—Sekhet.



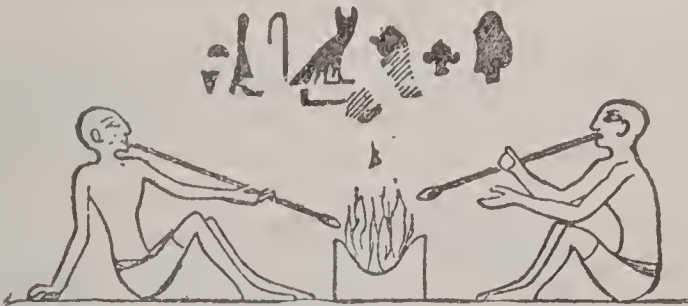
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duced into Greece by Rhœus. This art flourished best under the earlier dynasties, and had much degenerated in the 19th and 20th, though revived by the 26th. Painting appeared at the same age chiefly in tempera or whitewashed surfaces, though fresco was occasionally used, and encaustic appears only under the Greeks and Romans. This art, of course, was freer than sculpture, but yet had a rigid architectural character, and followed the same canon as sculpture, the colors used being generally the pure or primitive, and the background uniformly white. The architectural details of Egyptian temples and the hieroglyphs appear to have been always colored, and added additional charm to the sculptures. The religious papyri or rituals also were often embellished with elaborately colored vignettes, resembling the illuminations of modern manuscripts. Not less eminence had the Egyptians attained in the art of music, the harp and flute appearing in use as early as the 4th, and heptachord and pentachord lyres as early as the 12th dynasty; besides which, drums, tambourines, flutes, cymbals, trumpets, and guitars, are seen in the 18th, and the national instrument, the jingling sistrum in the 4th. Many of the instruments are of great size, and must have produced considerable effect. Nor was the art of song wanting, and measured recitations or songs occur on monuments of the 12th dynasty,



Sistrum.

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Egyptian Glass-blowers.

while the lays of Maneros traditionally dated to a still earlier period. Poetry, indeed, was at all times in use, and the antithetic genius of the language suggested the application of the strophe and antistrophe (see **HIEROGLYPHICS**), though it is not possible to define the metre. In the mechanical arts, many inventions had been made: the blow-pipe, used as a bellows, appears in the 5th dynasty; bellows and siphons in the 18th. The saw, adge, the chisel,

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press, balance, and lever appear in the 5th, the harpoon in the 12th, razors in the 12th, the plough and other agricultural implements in the 5th. Glass of an opaque kind is seen in the 4th, and dated specimens in the reign of Thothmes III. B.C. 1445), give the priority to E. (see GLASS); the oldest transparent glass, the Assyrian, not dating older than Sargina (B.C. 711). A glazed pottery or porcelain (see POTTERY), the potter's wheel, and the kiln, appear in the 4th; and the art of metallurgy, with the use of tin, at the same period. In the military art, the Egyptians used at an early age defensive armor of shields, cuirasses of quilted leather, and helmets; while spears, clubs, maces, swords, daggers, bows, and hatchets formed their offensive weapons. For sieges, they employed the testudo, ladders, torches and lanterns,



Bellows.

and mines. The army was composed of infantry till the beginning of the 18th dynasty, when war-chariots were introduced; for, prior to that period, the ass only was known

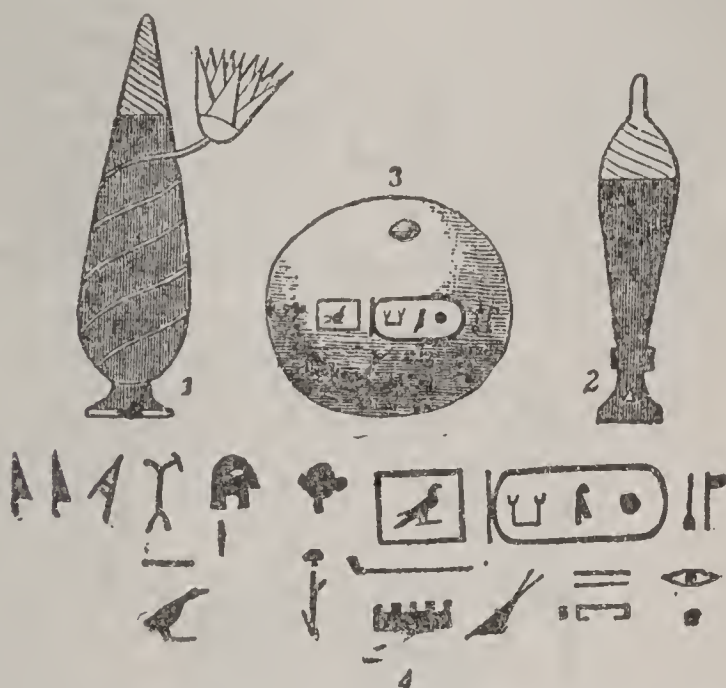


Siphons, used in the year 1455 B.C.

and used for transport; and carriages not having been invented, persons and goods were transported on the panniers of asses, or on a kind of saddle slung between two of these useful animals. War-boats no doubt existed at an early period, and are mentioned as early as the 12th dynasty;



but sea-going vessels not till the 18th, and no fleet till the 19th. The Nile, however, was constantly navigated by row-galleys with sails. An extensive commerce was carried on with neighboring nations, and their tribute enriched the country with slaves, cattle, gems, valuable metals, and objects of curiosity. Rare animals were collected for ostentation. Under the earlier dynasties, the chief occupation of the nation appears to have been rearing cattle, cultivating grain, indulging in banquets, fishing, fowling, and



1, 2, glass bottles represented in the sculptures of Thebes; 3, Captain Henvey's glass bead, about the real size; 4, the hieroglyphics on the bead containing the name of a monarch who lived 1500 B.C.

the chase, and the establishment of each noble contained in itself all the organizations and artificers necessary for its maintenance. How transactions were carried on without the use of money, is not very clear, unless gold circulated moulded in the shape of rings adjusted to a given weight, but coin plate is mentioned by its pounds, *mna*, and its ounces, *kat*. The Persians first introduced money: see NUMISMATICS. The wealth of families was, however, spent on the tombs and furniture of the dead, and the preparations for embalming, which were on so vast a scale that filial piety did not disdain to mortgage not only the sepulchres, but the very mummies of its ancestors: see EMBALMING. Amusements were various, from the single-stick and juggling, the dance of almehs, the bull-fight, to draughts, dice, and morris. In fact, ancient Egypt had a material civilization, which exerted all the requirements of industry, and forgot none of idleness. Pleasure was the object of existence, not, however, untempered by the voice of reason or the appeals of conscience, the moral code of duties being as pure as that of contemporary nations.

The civil government was administered by the three upper castes. The priests, distinguished by their superior knowl-

edge, cleanliness, and godliness, had the ecclesiastical; the temples being administered by high priests and an inferior hierarchy, with overseers, and governors of revenues, domains, and donatives. Each temple, like a monastic institution, had its carefully subdivided organization, each denizen having a separate charge or jurisdiction. The political and civil government was administered by royal scribes, or secretaries of state, who attended to the revenue, justice, foreign affairs, and all the interests of the executive. Sacred scribes attended to the ecclesiastic interests, and inferior scribes to the local interests. The public works, the collection of grain, and of the linen dues; the cattle, workmen, wells, irrigation, had each their separate superintendents and scribes. The military force of 410,000 men, at a later period, comprising all arms of the service, was ruled with severe discipline, and under the direction of nomarchs (*ha*), colonels (*hraz*), captains (*mer*), and lieutenants (*atnu*). The criminal and civil law was administered by judges (*satem*



A Guard apparently with a Lantern.

*en ash*), who held travelling assizes, and to whose tribunals the necessary officers were attached. The athlophoros or standard-bearer also transmitted the decrees of the royal chancery. The execution of deeds required so many witnesses that fraud evidently often occurred. The superior position of women in the social scale, notwithstanding the permission to marry within degrees of consanguinity usually forbidden, shows that the Egyptians reached a higher point of delicacy and refinement than either their western or eastern contemporaries. Colossal in its art, profound in its philosophy and religion, and in possession of the knowledge of the arts and sciences, E. exhibits the phenomenon of a surprisingly high and ancient civilization.

*Chronology and History.*—One of the most important points of Egyptian history is the chronological, involving as it does the date of the earliest historical epoch of man. In the time of Ptolemy Philadelphus, B.C. 3d c., Manetho of Sebennytus, high-priest of Heliopolis, drew up, at



the request of the king, a history, in which he divided the space of time from Menes to the reconquest of Egypt by Darius II. into 30 dynasties. The work of Manetho has perished, but chronological epitomes remain in the works of Julius Africanus, a writer of A.D. 300, and Eusebius, and Georgius Syncellus, A.D. 800. Besides the Bible, Herodotus, Diodorus, Josephus, and other writers, especially Eratosthenes, also contained sources of chronological information, and the learned of Europe for the last three centuries have studied to reconcile the conflicting statements of these authors, the discrepancy of their ciphers, and the inaccuracy of their details. Even in Biblical chronology, the Hebrew, Samaritan, and Septuagint versions gave very different results; but in England the chronology of Usher, which, from the Hebrew, placed B.C. 4004 as the date of creation, and B.C. 2348 for the Deluge, somehow obtained the sanction of theological writers, though it is conceded by later scholarship to be without sure basis. To reconcile these conflicting authorities, two schools of chronological critics, called of the Long and Short Chronology, have arisen, and the epoch of Menes has been placed by the advocates of the long chronology, as Boöckh, at B.C. 5702, by Bunsen, at B.C. 3643, by Lepsius, at B.C. 3892, by Henry, at B.C. 5305; while the same date falls, according to Sharpe, B.C. 2000, to Nolan, B.C. 2673, and Poole, B.C. 2717. Unfortunately, the monumental information is defective at certain periods, while in all, the national custom of dating in kings' reigns only, without the use of the controlling date of any cycle, renders the subject still more obscure; for the Sothic cycle, or Dogstar period of 1461 vague years, was not in official use. The celebrated hieratic papyrus at Turin, of the age of the 19th dynasty, which contained a system of chronology arranged on a principle of cyclic and regnal years, has unfortunately suffered so much mutilation that it is impossible to reconstruct it satisfactorily. It is therefore better to arrange the history according to the dynastic successions of Manetho, giving these as waves of time, leaving the question of their duration to individual judgment. At present, the elaborate systems of chronology are only chronological draughts from recollection of a vast ruin, each more or less fortunate or defective in some particular respects or general conception. There are not sufficient monumental data for a sure conclusion about the remoter dynasties. Mythically, Egypt was said to have been governed first by a dynasty of gods, who, according to Manetho and other Greek authors, were Vulcan or Ptah, Helios the Sun or Ra, Sôs or Shu, Saturn or Seb, Osiris or Heshar, Typhon or Set. and Horus or Hor. These gods reigned 13,900 years, and were succeeded by the Manes and demigods, whose reign occupied 4000 more years. But considerable difference exists in the lists—that of Thebes giving Amen, Mentu, Tum, Su and Seb, Osiris, Seti, and Horus; that of Memphis, Ptah, Ra, Shu, Seb, Osiris, Set, and Horus. After the reigns of the gods, the epoch of Menes is the first point in the chronology of the

history of ancient Egypt, and has been placed as above mentioned, by the rival systems of chronology.

No contemporary monuments of Menes exist, but he is said by tradition to have corrupted the simplicity of the patriarchal life of the nation, instituted the first laws, and divine worship, founded the temple of Ptah by turning the course of the Nile to the w. by means of a barrage at Kosheishe, and to have founded Mennefer or Memphis, after some expeditions against the Libyans, and to have been devoured by a crocodile. The statue of Menes is represented borne in ancestral procession in the reigns of Rameses II. and III. at Thebes, but no contemporary monument of this monarch exists. His successor Athotthis, wrote a work upon anatomy, and built the palace of Memphis. The other kings of this dynasty were Kenkenes, Venephes, who built the Pyramids at Ko or Kochrome, Miebis, Semempses, and Bieneches; but their names have not been identified, nor do any monuments of them remain. This dynasty reigned about 250 years, and was succeeded by the 2d, which lasted about 300 years, but of which no contemporary monuments remain. This dynasty, however, introduced the worship of sacred animals, and abolished the Salic law, which had hitherto prevailed. With the 3d dynasty of Memphites, which endured about 200 years, monumental history properly begins, the monumental king Seneferu of this dynasty having conquered the Sinaitic peninsula, and opened the copper mines of the Wady Magara. The 4th dynasty, also of Memphites, had an existence of 284 years. The celebrated canon of Turin contains fragments of the duration of the reigns and lives of the monarchs of this line, some of which were prolonged to upward of 90 years. Monumental remains are found of Soris. The two Khufus built the two great Pyramids of Gizeh, and held the Arabian peninsula in subjection. Cheops, or the elder of the two Khufus, constructed the largest of this group of the pyramids by means of a forced conscription, and was regarded as a detestable and impious tyrant. Subsequently, he repented, and wrote a book in honor of the gods, which had great reputation. Khafren, his successor, built the second of the great pyramids, and Mencheres, or Mycerinus, the third pyramid. The so-called book of the Ritual, which dates from this period, and the high civilization, which Memphis had then attained, mark an epoch in Egyptian civilization, and the numerous tombs, in the vicinity of the pyramid, constructed during this and the subsequent dynasty, exhibit a highly advancing civilization; the cultivation of farms, the chase, the arts, received much attention; but horses and wheel-carriages were alike unknown, though the simpler mechanical instruments and manufactured articles had been invented.

The 4th dynasty began, according to Lepsius, B.C. 3427. The 5th, which monumentally appears a continuation of the 4th, terminates with Annos or Onnos, who was killed by his guards. His sepulchre was the pyramid of the Mastabat-el-Faraoun, near Saqqarah. This 5th dynasty



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was, however, from Elephantine, and appears to have ruled in Upper as well as Lower Egypt, monuments of it being found in the Thebaid. Considerable difference, however, exists between Lepsius and Bunsen in the assignment of the royal cartouches of this period, Lepsius assigning them to the 5th, and Bunsen to the 3d dynasty. The group of the Abooseer Pyramids is of this age. The next dynasty, the 6th, a Memphite, was more remarkable; and tombs and numerous small objects of the period are found in Upper and Central Egypt, and in the valley of Hamamat, leading from Coptos to the Red Sea. The principal monarchs of this line were Othoes, killed by his guards; Phiops or Apappus, whose reign extended to 100 years; and Nitocris, whom the legends represent as drowning the murderers of her brother, and constructing the third Gizeh Pyramid, in which she was buried, and which she perhaps enlarged from the old original sepulchre of Mycerinus, having added to it the revetment of red syenitic granite. Of the 7th dynasty, two names, An and Assa, are supposed to have been found; but the monumental connection between the close of the 6th and 11th dynasties, has not been even conjecturally restored, from the conflicting tablets of Karnak and Abydos, and the mutilated papyrus of Turin. It is not possible to follow the order of the succession till the 11th dynasty, nor are there monuments either of a public or sepulchral nature to show the existence of the intermediate period, rendered more unintelligible by the contemptuous silence of the lists of Manetho, one tyrant, Achthoes, alone being mentioned in them. Considerable discrepancy exists between the canon of Turin and the lists of Manetho relative to this period; the canon making two dynasties—one of six, the other of 17 kings between the 6th and the 12th dynasty; Manetho, 86 kings, and about 500 years. The impossibility of reconciling these statements has given rise to the idea, that the lists were respectively Memphite and Theban, each having contemporary kings. The existence, however, of the 11th dynasty, consisting of a line of monarchs called Hantefs and Mentu-hetps, has been proved by the discoveries of their coffins in the tombs at Gournah and the El Assasifs, and the tablets of the island of Konosso and others, referring to the construction of the fortress of Coptos and in honor of the local god. The successive reigns and monarchs of the 12th dynasty are fixed by numerous monuments. Amenemha I., founder of the line, opened the quarries of Tourah, embellished An or Heliopolis, and founded the temple of Amen at Thebes, reigning nine years alone, and seven with Osirtesen I., his successor. A historical papyrus recording his dreams and other facts of this reign remains. The monuments of Osirtesen I. exist in the Faioum at Benihassan and Heliopolis; he subjected some of the Ethiopian tribes. During his reign there occurred a famine; and in the 38th year of his reign, he associated Amenemha II. in the government for four years. Little of historical import is known of his successors, Amenemha II. and Osirtesen II., except their conquest of Kash or Ethiopia, and the

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arrival of a tribe of 36 Amu or Semitics in the sixth year of Osirtesen II. These resemble, in their costume and physiognomy, the Hebrews, and have been supposed to represent the arrival of Jacob in Egypt. Osirtesen III., his successor, established the s. frontier at Samneh, which he fortified; and was subsequently deified in Nubia, and received, in the reign of Thothmes III., a worship in that region, and fortified Coptos. His successor, Amenemha III., excavated the Birket-el-Keroun or Moëris lake; constructed the Labyrinth, composed of 6,000 rooms; the Pyramid of Crocodilopolis, in its vicinity; and the temple of the goddess Athor at the Sarabout-el-Khadem. His successors, Amenemha IV. and the queen Sebeknefru, are known only from the remains of the Labyrinth, and some inferior monuments. The same difficulty of tracing the succession which exists between the 6th and 12th, occurs again between the 12th and 15th. The most plausible conjecture, however, is that the 13th (Diospolite) and the 14th Xoite dynasty, in Lower Egypt, were contemporaneous, and that the 15th and 16th Theban and Diospolitan had for their contemporaries the 17th Hykshos or Shepherd dynasty in Lower Egypt. The monarchs of the 14th dynasty appear from the monuments to have been occupied in regulating the course of the Nile at Samneh, while their power reached from the isle of Argo to El Hamamat, and they engaged in traffic with the Phœnicians. About B.C. 2000, the advance of the Assyrians in Asia, or some internal revolution, precipitated the so-called Hykshos or Shepherd Kings, who appear to have been Arabs or Phœnicians, on Lower Egypt. These invaders overthrew the Xoite dynasty of Lower Egypt, took Memphis by assault, and established themselves in the city of Haouar or Avaris, subsequently called Tanis, where their monuments still exist. But the Egyptian rulers of Upper Egypt overthrew their rule, and under Ra-skenen, the last king of the 16th dynasty, Avaris was invested, while his successor, Aahmes I., of the 17th, took it by assault, besieged Sarahan or Sharon, and attacked the mountaineers of Nubia. The Hykshos endeavored to substitute the worship of Sut or Set for Ra or the Sun, but Aahmes I. restored the ancient temples, and opened the quarries of Tourah. Amenophis I., his son and successor, who reigned under the tutelage of his mother, continued the Ethiopian campaigns, and embellished Thebes. Thothmes I. carried his arms to Tombos, in the heart of Nubia, and into Naharaina or Mesopotamia, and embellished Thebes. Thothmes II., who reigned under the guardianship of Hatasu, defeated the Shos. His brother and successor, Thothmes III., elevated E. to the highest pinnacle of glory; and by the victory of Megiddo, in his 23d year, subjected the whole of Syria and part of Mesopotamia to his arms, receiving immense tributes from Kash and the Ethiopian races of the south, the islands of the sea, and Assyria, Babylon, Phœnicia, and Central Asia, and endowing the Temple of Thebes with the revenues of tributary cities. A calendar preserved at Elephantine recording the heliacal rise of





Egypt.—Wall-painting from the Tomb of Pta-hotep, at Sakkarā; of the Pyramid Age.

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the Dog-star on the 28th Epiphi, shows that the year B.C. 1444 fell in his reign. Thothmes III. recovered the



Head of Thothmes III.

copper mines of Magarah, and decorated all Egypt. Amenophis II. continued the conquests of the Ruten, took Nineveh by assault, and vanquished the Ethiopians. Thothmes IV. is supposed to have erected the Great Sphinx. Amenophis III. maintained the frontiers of the empire. At this period, a heresy was introduced into E., favored by the queen Taia. Amenophis IV. became a worshipper of the Aten or solar orb, to the exclusion of the other deities of E., especially of Amen Ra. The capital was removed to Tel-el-Amarna or Alabastron; the king changed his name to Akhuenaten, and a succession of three heretic monarchs ruled E. for about 33 years, till Haremhebi

or Horus restored the old faith and the limits of empire.

The link which connects the last monarchs of the 18th to the monarchs of the 19th dynasty has been lost; but Horus was succeeded by Rameses I.—the first of a long line of monarchs—who appears to have formed a treaty with the Khita or Hittites, and to have advanced the conquests of E. to the Wady Halfa. He was succeeded by Seti I. or Sethos, who attacked the Remenu or Armenians, the Rutennu, and the Shasu or Shepherds, who had again advanced to the Pa-khetem or Pithoum, on the confines of Egypt. Naharaina or Mesopotamia, and Sharu or Syria, Pânt or Phœnicia, had also been invaded by his arms. The city of Atsh or Katsh, the supposed Cadytis, also was besieged by Sethos, whose Asiatic victories introduced into E. the worship of Baal and Ashtarothe. Tyre, Avathus, and Bethanath in Canaan, were garrisoned by his forces. E. was also embellished with many noble monuments in his reign. He was buried in a deep excavated rock-tomb in the Biban-el-Molook—the kings of the 18th and 19th dynasties having substituted long excavated tunnels or syringes, in the mountains of the Arabian chain of W. Thebes, for the ostentatious pyramids in use from the 4th to the 12th dynasty, which attracted the cupidity of the invaders of Egypt. Rameses II., son of Seti I., seems to have succeeded him at the very youthful age of seven. In his fifth year, he defeated the Khita and their Syrian confederates at the battle of Katsh, in which many of the princes and officers of the Khita were drowned in the river Arunata, or Orontes. The battle endured two days, and the panegyric of an Egyptian scribe, Pentaur, has invested Rameses with the power of a god. The war lasted till his ninth year, and the king took Shaluma or Salem, the an-



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cient site of Jerusalem, and other cities. In his twenty-first year, a treaty of peace and extradition was established between the two countries, and Rameses married a princess of this nation. It is the tablet of this monarch which is found at the Nahr-el-Kelb, or Passes of the Lycus, near Beyrout. This monarch subjected Ethiopia, which had revolted, to his arms, reimposed the tribute, and placed the country again under the government of the princes of Ethiopia, or Egyptian viceroys. He also established a fleet on the Mediterranean. His name and reputation formed the basis of the legendary Sesostris; the exploits of the monarchs of the 18th dynasty, and probably of his successors, being united with his fame. The reign of Rameses, though it exhibits a decline of art, yet demonstrates E. to have been in the height of its glory; and his epoch appears to have been about B.C. 1323, a special calendar having been sculptured to record the coincidence of the heliacal rising of the Dogstar and 1st Thoth, or commence-



Rameses II.

ment of the fixed and canicular year. His place of burial is uncertain—perhaps in the vaults of the Ramesseum. His 13th son, Merienptah or Menephthes, succeeded him upon the throne, transferred the capital to Memphis, successfully contended with the Tamahu or Libyans and the Rabu, and appears to be the Amenophis of Manetho, and the Pharaoh of the Exodus. He introduced the heretical worship of Sut, Seth, or Typhon, and was succeeded by Sethos II., Amenmes, Siphah, Tausri, and Setinekht, whose inglorious reigns close the 19th dynasty. The connection of Rameses III. with the previous dynasty is obscure. This monarch was chiefly at war with the Philistines, and the other maritime tribes of Greece and Asia Minor, and gained naval victories in the Mediterranean, and repeated the conquest of Ethiopia. He was followed

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by the splendid but inglorious line of the Ramessids, the sixth of whom gained victories in Ethiopia; and the twelfth of whom, having married a princess of the land of Bakhten, sent the ark of the god Khous to Bakhten, at the request of the monarch of that country, for the cure of the queen's sister. The fall of this dynasty appears to have been owing to internal revolution, as their Tanite successors held the office of high priests of Amen Ra-at Thebes. They held the government for 130 years, and entertained foreign relations, one of the monarchs having married a princess of the Rutannu. The 22d dynasty, the monumental, is rather confused. They were also high priests of Amen Ra. Shashank I. is the Biblical Shishak. His invasion of Israel, with 12,000 chariots and 60,000 cavalry, and the capture of Jerusalem, is recorded on the portico of the Bubastites at Karnak. The other monarchs of this line, Osorkon I., Takehot I., and their successors, have left no remarkable records; and the dynasty, which appears of foreign origin, is more chronologically than historically important, the taking of Jerusalem falling between B.C. 989 and 959. The 23d Tanite dynasty, which succeeded it, exhibits a decadence in E., and was succeeded by the 24th dynasty, of a single monarch, the celebrated Bekenrenfor Bocchoris, who reformed the laws; but having been taken prisoner by the Ethiopian Sabaco, of the 25th dynasty, was burned alive. From this period, the history of E. becomes involved with that of Judæa and Greece. Tirhaka came to the assistance of Hezekiah against Sennackerib, and built the temple of Gebel Barkal. According to this Assyrian cuneiform inscription, the Ethiopians were expelled by the Assyrians, and the country placed under various monarchs. This state of affairs was closed by the rise of Psammitichus I. of the 26th dynasty, who, by the aid of Greek mercenaries, overthrew the other petty princes. His age marks a revival in art, and restoration of the old constitution of the empire. His successor, Nekao, or Nechos II., planned the canal across the isthmus of Suez, from which he desisted, warned by the advice of an oracle, after having lost 120,000 men in the attempt. Under his reign, the Phœnician navigators first passed the line. After defeating Josiah, king of Judah, and conquering Palestine, he was himself defeated by Nebuchadnezzar at Karkemish. Psammitichus II. carried his arms into Ethiopia. Apries, his successor, having lost all the conquests, was deposed by Amasis, his successor, and strangled. Amasis favored in different ways the Greek colonies in E., and married a Cyrenæan wife, and conquered Cyprus, but incurred the enmity of Cambyses, who overthrew his son and successor at the battle of Pelusium (B.C. 526-7). Cambyses treated E. with considerable moderation, but after an unsuccessful expedition against the Ethiopians, lost his reason, stabbed the bull Apis, and committed various atrocities. His successor, Darius I., governed E. with more prudence; but Xerxes I. and Artaxerxes I. had successively to reduce it to subjection, which they did in spite of assistance rendered to it by the Athenians. The 27th dynasty of Per-



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sians was followed by the Saite line, the 28th, Amyrtæus and Pausiris, who still held ground against the Persians; the 29th, Mendesian dynasty of Nephherches and Achoreus, maintained a Greek alliance; and the 30th, Sebennytic, consisted of Nectanebes I., who successfully resisted Pharnabazus and the Iphicrates; of Teos, who employed Agesilaus; and Nectanebes II., who fled into Ethiopia before the Persians (B.C. 340).

From this time, E. remained a province of Persia till its conquest by Alexander the Great, who founded Alexandria. Subsequently, E. passed under the Greek rule, and the language of the government, and the administration and philosophy, became essentially Greek. The court of the Ptolemies became the centre of learning and philosophy; and Ptolemy Philadelphus, successful in his external wars, built the Museum, founded the library of Alexandria, purchased the most valuable of manuscripts, engaged the most celebrated professors, and had the Septuagint translation made of the Hebrew Scriptures, and the Egyptian history of Manetho drawn up. His successor, Euergetes, pushed the southern limits of his empire to Axum. Philopator (B.C. 221–204) warred with Antiochus, persecuted the Jews, and encouraged learning. Epiphanes (B.C. 204–180) encountered repeated rebellions, and was succeeded by Philometor (B.C. 180–145) and Euergetes II. (B.C. 145–116), by Soter II. and Cleopatra till B.C. 106, and by Alexander (B.C. 87), under whom Thebes rebelled; then by Cleopatra Berenice, Alexander II. (B.C. 80), and Neos Dionysus (B.C. 51), and finally by the celebrated Cleopatra; and after the battle of Actium (B.C. 30), E. passed into the condition of a province of Rome, governed always by a Roman gov. of the equestrian, not senatorial rank.

The most important events in E. under the Roman rule were—the introduction of the Julian year by Augustus (B.C. 24), the visit of Vespasian to Alexandria (70), and that of Hadrian (122), the development of the Gnostic heresy, the visit of Caracalla (211), the conquest of E. by Zenobia (270), the revolt of Firmus (272), the persecution of Diocletian (304), and the rise of Manicheism, the great Arian controversy in the reign of Constantine, the rise of asceticism, magic, and astrology, and the final destruction of paganism (379).

At the division of the empire (395), E. fell to the Eastern Empire, and, at its fall, had become one of the Great Patriarchates of the Christian Church; but owing to the religious feuds of the Jacobites and Melchites, it became a province of Persia (616) for 12 years. The Coptic gov. Makaukas, who reigned in the name of Heraclius, endeavored to make himself independent, and invited the arms of the Arabs, and Omar I. easily conquered E., in the 19th year of the Hegira (640).

*History since the Mohammedan Conquest.*—Although Alexandria was retaken by Constantine III., the Arabs drove him out, and E. remained an appanage of the califat. It afterward passed into the dynasty of the Thonlounides (868): a new dynasty, the Akshidide, succeeded in 985, to

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give way to the Fatimide in 969, under which Cairo was built, and E. regained some of its prosperity, although in 1118 Baldwin I. burned the maritime town of Faramah. Subsequently it passed under the Ayoubites, and Saladin, who fortified Cairo, built the citadel, excavated the well, and erected the granaries of Jusuf. In 1218, the Crusaders took Damietta, but were subsequently driven back 1221. One of the later princes, Saleh-Nedjim Eddin, built the castle of Rhodah, and created the order of Mamelukes; but Louis IX. of France (1248) took Damietta and gained the battle of Mansourah. In 1254, the Ayoubites entirely fell, and E. became subject to the Baharite and Bordjite Mamelukes, under whose government it flourished, and even pushed its conquests to Cyprus and Asia Minor, till, in 1517, Touman Bey fell into the power of Selim I., and E. became a province of the Turks, and administered by pashas. In 1601, the use of tobacco was introduced. Constant rebellions of the Mamelukes, and the violence of contending factions, distracted the country. The most remarkable event of this period was the French invasion by Bonaparte 1798, which, by the conquest of Alexandria, and the battle of the Pyramids against the Mamelukes, led to the entire subjection of the country, from which the French were finally expelled by the Turks and British 1801, and the country restored to the Ottoman Porte. The rise of Mohammed Ali 1806 imparted a galvanic prosperity to E., by the destruction of the Mamelukes, the formation of a regular army, the increase of security, the improvement of the irrigation, and the introduction of European civilization. In 1816, Mohammed Ali rendered part of Arabia tributary by means of his son-in-law, Ibrahim; and afterward wrested Syria from the Porte, and held it as tributary by the treaty of Kutahia 1835. The victory of Nisib, 1839, would have elevated him to the throne of Constantinople; but the quadruple alliance in 1840, the fall of St. Jean d'Acre to the British, and the evacuation of Syria, compelled him to limit his power to the pashalik of Egypt. Ismail Pasha reduced Nubia to a dependency of Egypt 1820. In 1849, Mohammed Ali died, and was succeeded by Abbas Pasha, his grandson, replaced in turn by Said Pasha 1854. M. de Lesseps now obtained the previously withheld co-operation of the Egyptian govt. in his scheme of the Suez Canal (opened 1869). Said was succeeded 1863 by his nephew, Ismail, who, by leave of the sultan, took 1866 the hereditary title of khedive (q.v.). The same firman made the succession to the throne of Egypt direct from father to son, instead of descending, according to Turkish law, to the eldest heir; and 1873 the sultan granted to the khedive the right (withdrawn 1879) of concluding treaties and that of maintaining an army. Darfur was annexed to E. 1874, and in that and the following year further conquests were made in the south. Through Sir Samuel Baker and Gordon Pasha (Gen. Gordon), gov. of the Soudan, the khedive endeavored to suppress the slave-trade in his dominions. In 1875 the khedive sold to Great Britain 177,000 shares in the Suez Canal (q.v.) for £4,000,000.



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The condition of the Egyptian finances was almost hopelessly involved, when in 1876 the revenue was put under the management of European commissioners. An Egyptian contingent of about 10,000 men, under the command of Prince Hassan, third son of Ismail Pasha, fought for the crescent in the Russo-Turkish war of 1877-8. The new financial system having proved unsuccessful, another commission of inquiry was appointed; and ere long it was announced that the khedive had absolutely accepted the European system of constitutional government, and had made Nubar Pasha head of a reformed administration. The summary dismissal of this ministry 1879, Apr., was followed by the interference of the European governments. The khedive, who declined voluntarily to abdicate, was, at the instance of the western powers, deposed by his suzerain the sultan in June, and Prince Tewfik, Ismail's eldest son, was proclaimed viceroy of Egypt. D. 1892.

A Law of Liquidation, for regulating the conditions of the public debt, was passed at the instance of five European powers 1880. In the next year came the military revolt under an officer, Arabi Pasha, who demanded from the khedive an immediate change of ministry, and the increase of the army to 18,000 men. The khedive yielded. Growing dislike to European interference, and to the presence of European officials, secured Arabi a large measure of popular support, when, as war minister, he overawed the khedive, and ultimately defied his authority. He was practically a military dictator, and in 1882 strengthened the fortifications of Alexandria. British and French war-ships had been dispatched to Alexandria; and the British admiral demanded that work at the fortifications should be discontinued. Arabi persisted; and after an atrocious massacre of Europeans in the streets of Alexandria, the British ships bombarded the fortifications (July 11). The Egyptian troops were suddenly withdrawn from Alexandria, whereupon the city was plundered and partly burnt by riotous Egyptians. An English military expedition was manifestly inevitable; troops were now swiftly dispatched from England and from India, including a large contingent of native Indian soldiers. The point of debarkation was Ismailia, on the Suez canal; and in 25 days the British forces under Wolseley had traversed the desert, utterly defeated the main body of Arabi's army at Tel-el-Kebir, and occupied Cairo. The authority of the khedive restored, most of the British troops were withdrawn, and measures taken for the reorganization of the country. The French, who had been associated with Britain in what was known as the Anglo-French Control, took no share in the bombardment, in the military expedition, or in direct co-operation with Britain in the re-arrangement of Egyptian affairs on a fair basis. Many of Arabi's supporters were executed; Arabi was banished to Ceylon. The aim of the English cabinet was to secure, as soon as possible, a firm and lasting government under the khedive, but a large measure of interference with the Egyptian government was for the time being inevitable.

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The attempt to persuade the khedive's government to rule according to English ideas, and to get English officials and their Egyptian colleagues to work smoothly together, led to repeated crises and changes of plan. A conference of the great powers 1884 did not sanction the English scheme for managing Egyptian finance; and the English government had gradually to assume more direct responsibility in Egypt. A severe visitation of cholera occurred in the summer of 1883; about 150,000 persons were thought to have perished.

*The Rebellion in the Soudan and Later Events.*—Baker Pasha's annexations, 1874 and following years, had extended the possessions of E. s. to the shores of the Victoria Nyanza; but Arabi's revolt had the effect of weakening the Khedive's authority in those territories. Rebellion was fomented in Darfur and Kordofan by Mohammed Ahmed, styled the Mahdi (q.v.: see also ISMAILIS: MOHAMMEDAN SECTS: KARMATHIANS). The Mahdi sent his missionaries forth to preach the doom of Turkish rule in the Soudan and the advent of 'the one guided by God.' The Mahdi occupied El Obeid 1883, Jan.: an army under Hicks Pasha (q.v.), an English officer, was annihilated near El Obeid 1883, Nov. Meanwhile Charles George Gordon (q.v.) had been commissioned to visit the Soudan and to conciliate the rebels by giving back to the local sultans their ancestral powers, withdrawn or suspended during Egyptian occupation, and by retiring the Egyptian garrisons. Gordon having reached Khartoum, found the Mahdi unwilling to treat. The Mahdi demanded the unconditional surrender of the town, and on Gordon's refusal, laid siege to it, and it was captured 1885, Jan. 26; Gordon and nearly all the Europeans in the place, military and civil, were massacred. An expedition commanded by Gen. Lord Wolseley reached Khartoum two days after Gordon's death, but withdrew without any attempt to retaliate, and the Soudan was for the time left to its anarchy.

The work of deepening and widening the Suez canal, so as to add 15 metres (about 50 ft.) in width, and to make its depth  $8\frac{1}{2}$  metres (about 28 ft.), was begun 1886; a loan of \$20,000,000 was raised for making the enlargement. The *Corvée* or system of forced labor on the irrigation canals was abolished 1887; the same year, under an international convention, the Suez canal was declared exempt from blockade and military operations, and ships of all nations were assured unimpeded passage in peace and war. The Khedive Tewfik died 1892, Jan. 7, and was succeeded by his eldest son, Abbas, who made efforts in 1893 and 1894 to shake off the English control of the administration, but was compelled to submit by the prompt action of Turkey forced by England. A steady increase in the prosperity of the country and surplus revenue amounting to a total of over \$25,000,000 in 1895, which however can only be used to extinguish the debt, has resulted from English rule.—See SUDAN: NUBIA: KORDOFAN: DARFUR: MEHEMED ALI: NILE: also BAKER, Sir SAMUEL WHITE: GORDON, CHARLES GEORGE: HARAR: ETC.

*Statistics of Modern Egypt.*—The area of Egypt proper is



## EGYPTIAN—EGYPTIAN VULTURE.

about 400,000 sq. m., and at census of 1897 (latest) its pop. was 9,734,405. With territories in central Africa, now no longer Egyptian, area of Egyptian domains was estimated 1,150,000 sq. m., with population of 17,000,000. Chief towns of Egypt proper are Cairo (pop. 1897, 570,062); Alexandria (319,766); Damietta (31,515); Tantah (57,289); Mansourah (36,131); Zagzig (35,715); Assiout (42,078); Port Said (42,095); Kena (27,478). There are in Egypt about 112,500 foreigners, including 38,175 Greeks, 24,467 Italians, 42,095 Frenchmen, 19,557 Englishmen. Estimated revenue 1902 was \$60,000,000. Expenditure \$55,000,000. Principal of debt, 1902, \$516,322,700. Total exports 1902 valued at \$88,085,015, chiefly cotton, cottonseed, beans, sugar, grain; imports, \$74,073,440, chiefly cotton goods and other textiles, machinery, and coal. Railway system comprised more than 1,250 m. connecting Alexandria and Damietta with Cairo and Suez canal, extending up Nile valley as far as the Siout; telegraph lines reached nearly 5,200 m. and there was a telephone between Cairo and Alexandria. E. paid a tribute of \$3,325,205 to Turkey 1902, maintained a native army of 13,000 men and an English army of occupation of 3,200.

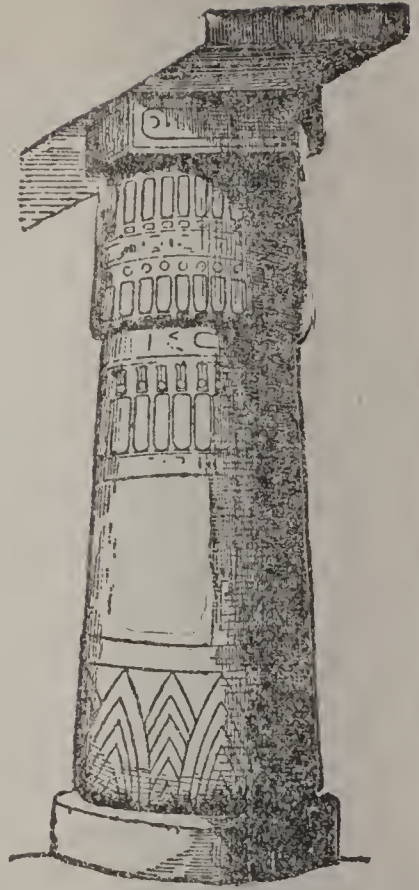
For further information on E., its history, antiquities, and present condition, see Bunsen, *Aegyptens Stelle* (1845-57); Lepsius, *Denkmäler* (1849-74) and other works; Sharpe, *History of Egypt* (1846); Brugsch, *Histoire d'Égypte* (1849; new ed. 1875); Wilkinson, *Manners and Customs of the Egyptians* (1847; new ed. by Birch, 1879); Lane, *Modern Egyptians* (1842); M'Coan, *E. as it is* (1877); Jerrold, *E. under Ismail Pasha* (1879); Rawlinson's *History of Ancient Egypt* (1881); S. T. Poole's *Egypt* (1881); E. Wilson, *The E. of the Past* (1881); Professor Eber's *E., Historical and Descriptive* (transl. 1882); Villiers Stuart, *E. after the War* (1883); Mackenzie Wallace, *E. and the Egyptian Question* (1883).

EGYPTIAN, a. *ē-jīp'shī-ăn* or *-jīp'shăn* [Gr. *Aiguptos*—from *gaia*, land; *koptos*, Coptic]: pertaining to Egypt or the Coptic land. N. a native of Egypt; in *OE.*, a gypsy. EGYPTOL'OGY, n. *-tōl'ō-jī* [Gr. *logos*, discourse]: study of the archeology of Egypt, particularly in connection with hieroglyphics. EGYPTOL'OGIST, n. one skilled in the knowledge of hieroglyphics. EGYPTOG'GRAPHY, n. *-rāf-ī* [Gr. *grapho*, I write]: the art of writing in hieroglyphics or picture symbols. EGYPTIAN-BEAN, n. probably the fruit of *Nelumbium speciosum*. EGYPTIAN-BLUE, n. pigment of a brilliant color, made of hydrated protoxide of copper mixed with a very small quantity of iron. EGYPTIAN-JASPER, n. variety of jasper with zones of brown and yellow; found in the desert between Cairo and Suez. EGYPTIAN-THORN, n. in *bot.*, *Acacia* (q. v.) *vera*.

EGYPTIAN VULTURE, *ē-jīp'shan vūlt'yōr* (*Neophron percnopterus*): one of the smaller *Vulturidæ*, of a genus differing from the true vultures in the slender bill, which is covered for more than half its length with a naked cere,



Egypt.—Village Sheikh (statuette in wood, Boulak Museum).



Egypt.—Column from the Hypostyle of Karnak.



Egypt.—Head of Nefert, from Meydûn.

Egypt.—Musicians and Dancers.





and sharply hooked at the point. The head and throat are naked, but feathers extend along the back of the neck to the crown. The E. V. is not much larger than a raven. The plumage of the male is white, except the great quill-feathers, which are black. This bird is plentiful in Egypt, where it renders important service—as also in Turkey, Syria, and other countries—in devouring and so cleansing away carrion from the vicinity of human abodes. It is constantly seen in the streets of towns, and seems aware that it is regarded with favor, and enjoys the protection of mankind. Europeans in Egypt often call it Pharaoh's Hen, or Pharaoh's Chicken. It follows caravans in the desert, to devour whatever dies. Numbers are often seen congregated together, but the E. V. is not truly gregarious, and



Egyptian Vulture and Young.

lives generally in pairs. Its geographic range extends over the whole of Africa, and great part of Asia; it is common in many parts of the south of Europe, is an inhabitant of the Alps and the Pyrenees, sometimes visits more northern regions, and has been killed in England.

EH! int. ě or ā [AS. æ or *ea*, eh!]: a word expressing inquiry or slight surprise.

EHRENBERG, *ä'rën-běrch*, CHRISTIAN GOTTFRIED: 1795, Apr. 19—1876, June 27; b. Delitzsch, Prussian Saxony: naturalist. He studied medicine at Leipzig and Berlin, applying himself specially to botanical subjects demanding the microscope—whose capabilities E. was one of the first to appreciate. In 1820, E. visited Egypt, Syria, and Arabia, returning 1826 to Berlin, where he was appointed to one of the medical chairs of the univ., which he occupied until his death. Three years were given to the arrangement and classification of his abundant scientific

## EHRENBREITSTEIN—EICHSTÄTT.

materials; and to this period belongs the composition of his *Akelephen des Rothen Meeres*, and his *Symbolæ Physicæ*. In 1829, E. accompanied Humboldt on an expedition to the Ural and Altai mountains, collecting materials for his numerous memoirs on the Infusoria, and for his great work *Infusionsthierchen*, published at Leipzig, 1838: see INFUSORIA: ROTATORIA. Another work, *Mikrogeologische Studien*, springs from the application of the microscope to geology.

**EHRENBREITSTEIN**, *ā-rén-brīt'stīn* (Honor's Broad Stone): town and fortress of Rhenish Prussia, picturesquely situated on the right bank of the Rhine, directly opposite Coblenz, with which it is connected by a bridge of boats and a magnificent railway bridge of iron. Its trade is in wine and corn. Pop. (1880) 5,692 ; (1885) 5,299.

The fortress of E. occupies the summit of a precipitous rock 370 ft. above the river, and has been called the Gibraltar of the Rhine. On three sides the fortress is so precipitous as to be perfectly inaccessible; on the n.w. it is very strongly fortified, so that with the fortifications of Coblenz, E. is one of the most important fortresses of the world. E. was besieged in vain by the French 1688, but fell into their hands 1799, after a siege of 14 months. Two years afterward the French, on leaving E., at the peace of Luneville, blew up the works. It was assigned to Prussia by the Congress of Vienna 1814, and was restored and thoroughly fortified. The view from E. along the Rhine and Moselle is very extensive and beautiful.

**EHRETIA**: see BORAGINÆÆ.

**EIBENSTOCK**, *ī'bén-stōk*: town of Saxony, 16 m. s.s.e. of Zwickau; a centre of lace-making industry. Pop. (1880) 6,706.

**EICHHORN**, *īch'horn*, JOHANN GOTTFRIED: 1752–1827; b. Franconia: distinguished German scholar. He studied at Göttingen. In 1775, he became prof. of oriental languages in the Univ. of Jena, and 1778 at Göttingen, where he died. His scholarship was almost universal, and he left numerous treatises on a multitude of subjects, both ancient and modern, classical and oriental; but he is known in England and America chiefly as a biblical critic, and a leader of what is called the rationalistic school. E. examined the Scriptures from an anti-supernatural point of view, but applied to their elucidation and criticism an unrivalled knowledge of oriental and biblical antiquities. He rejected some of the books of the Bible as not genuine, and suggested that the canonical gospels were compiled from older documents. On this subject his suggestions retain extensive influence; but his general system of extreme rationalism in dealing with the records of the Bible can hardly be said now to exist. His works comprise a Library of Biblical Literature, Introductions to the Old Testament, the New Testament, and the Apocrypha; Histories of the Literature of Modern Europe and of Literature generally; a Universal History; and a History of the House of Guelf.

**EICHSTÄTT**, *īch'stēt* (earlier *Aichstadt*, Oak-town): town



## EICHWALD—EIDENT.

of Bavaria, in a deep valley on the left bank of the Altmühl, about 40 m. w.s.w. of Regensburg. Here is the palace of the Dukes of Leuchtenberg, with a museum; an imposing Gothic cathedral founded 1259; the old town-house; and near it, the ruined Wilibaldsburg on an eminence 1,200 ft. high. There are some manufactures. E, which is of Roman origin, became a bishopric 745, was surrounded by Roman walls 908, was cap. of a small principality, and became finally Bavarian 1855. Pop. (1880) 7,489 ; (1885) 7,631.

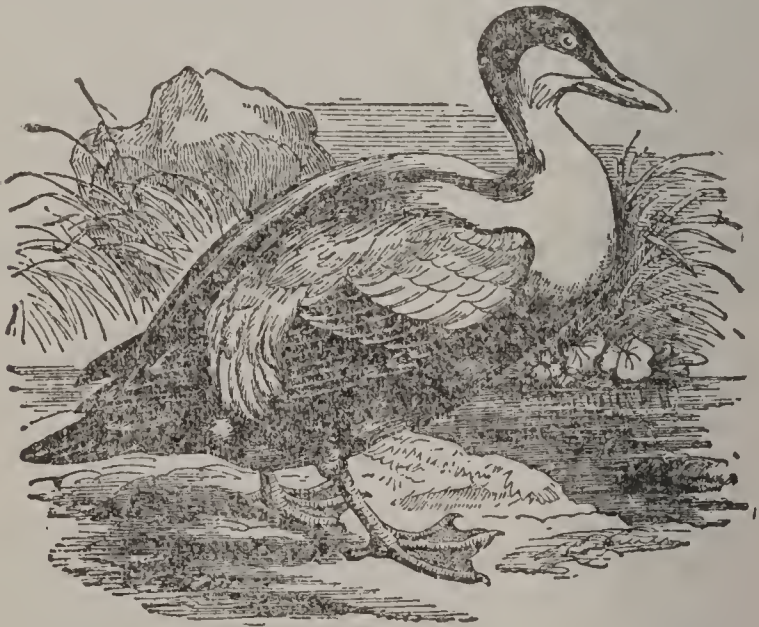
EICHWALD, *īch'vált*, EDUARD: 1795, July 4—1876, Nov.; b. Mitau, Russia; naturalist. He studied at Berlin. He was prof. of zoology successively at Kasan, Wilna, and (1838–57) St. Petersburg. E. investigated the shores of the Caspian Sea, the Caucasus, Persia, Germany, Switzerland, and France, travelled over the greater part of Russia, including the Scandinavian provinces, and in 1840 made a geological journey through Italy, Sicily, and Algeria. His geognostic, botanical, and zoological researches were unquestionably of more service to Russia than those of any man since Pallas. His principal writings are—*Zoologia Specialis* (Wilna 1829–31); *Plantarum Novarum quas in Itinere Caspio-Caucasico observavit, Fasciculi* (Wilna-Leip. 1831–33); *Travels to the Caspian Sea and the Caucasus* (Stuttg. 1834–37); *Memoir on the Mineral Riches of the Western Provinces of Russia* (Wilna 1835); *Paleozoic Russia* (1840); *The Paleontology of Russia* (1851). Other paleontological treatises appeared as late as 1872. E., who was a member of many learned societies, died at St. Petersburg.

EIDENT, a. *ī'děnt* [Icel. *idín*, laborious; *idne*, labor]: in *Scot.*, diligent; steady; busy; continual; other spellings are, ITHAND, YDANT, ÝTHAND, a. *ī'thänd*.

## EIDER.

**EIDER**, *ī'dēr* : river of n. Germany, forming the boundary between Schleswig on the n. and Holstein on the south. It rises 12 m. s.w. of Kiel, flows first n.w., then in a general w. direction, though with many windings, and enters the North Sea at Tönning, after a course of about 90 m. It is navigable as far as Rendsburg, from which town the Schleswig-Holstein canal stretches e. to Kiel Fiord, on the shore of the Baltic, thus establishing water communication between the North and Baltic seas.

**EIDER**, n. *ī'dēr* [Icel. *ædar*; Sw. *ejder*; Ger. *eider*, an eider-duck]: the down or very fine feathers of a species of duck found in large numbers in Greenland, Iceland, Sweden, etc. **EIDER**, or **EIDER-DUCK** (*Somateria*): genus of oceanic ducks, having the hind toe furnished with a deep lobe, and the bill swollen and elevated at the base, and extending up the forehead, where it is divided down the middle by an elongated projection of feathers. The tertials are elongated, and fall down over the wing. This genus is further characterized by the very abundant development of a fine elastic gray down, particularly on the breast, the valuable *Eider-down* of commerce.—The **COMMON E.** (*S. mollissima*) is intermediate in size between a common duck



Common Eider-Duck (*Somateria mollissima*).

and a goose; not much exceeding the common duck in entire length, because of the comparative shortness of the neck, characteristic of the oceanic ducks, but being about twice its weight. The male is larger than the female; and, in the breeding season, has the under parts black, the upper parts and the neck white, the crown of the head velvety black, the cheeks greenish white. After the breeding season, the white color almost disappears from the upper parts, and gives place to black, without change of feathers. The female is of a pale-brown color, tinged with red, and varied with transverse marks of dark brown. Young males at first resemble the females, and do not ac-



## EIDER.

quire the full adult plumage till their third winter. The young are termed Brattocks in many parts of Scotland. The E. is an inhabitant of the n. parts of the world, abounding on arctic and subarctic shores, and becoming rarer in more s. and temperate regions. It is merely an occasional winter visitant in the middle latitudes of Europe, and the Fern Islands are its most southern breeding-place on the British coasts. In N. America, the similar species has been separated under the name *S. dresseri*; it has no conspicuous difference, and breeds in n. N. America, where hitherto the gathering of the down has been generally neglected; but in Iceland and Norway the breeding-grounds of eiders are carefully protected, and are transmitted as valuable inheritances from father to son. Cattle are sometimes removed from islets, in order to induce the eiders to settle upon them, and a strict watch is kept against dogs and foxes. Promontories are sometimes even formed into artificial islets, on the same account, as the E., like many other sea-birds, prefers islands for its breeding-places, probably on account of their greater quiet and security. The nest is formed of fine sea-weeds, mosses, and dry twigs, if they are to be had, matted and interlaced. The eggs are usually five, sometimes six or seven in number, about three inches long, and fully two inches broad, of a uniform pale green; they are at first deposited without any down, but as incubation proceeds, the mother strips the down from her breast, and places it about them. By it they are kept warm when she at any time has occasion to leave them, but it seems indispensable to their being hatched; for if the eggs and down are removed, and if this is done a second time, so that the female cannot afford a further supply, the male comes and contributes for the third set of eggs the down of his breast, which is of a paler color. The common practice in Norway and Iceland is to take away the eggs and down twice, leaving the third set of eggs to increase the number of the species. The eiders of the Icelandic and Norwegian breeding-grounds show so little alarm at the approach of visitors, that the females will permit themselves to be touched as they sit on their nests, the males moving about close beside them, but agitated and disturbed. The nests are often placed so close together that great care is necessary in walking among them to avoid trampling upon them. In the Islet of Vidöe, a valuable breeding ground near Reikiavik, the capital of Iceland, almost every little hollow place between the rocks is occupied by the nests of these fowls; they readily take possession of holes cut for them in rows in the sloping side of a hill; nay, garden-walls and the interiors of buildings are in like manner occupied. In Orkney and Shetland the E. is commonly known by the name of Dunter-Duck.

The E. is called sometimes ST. CUTHBERT'S DUCK, from a rock called St. Cuthbert's Isle, one of the Fern Islands. It seems probable that, with due care, the number of the eiders at the Fern Islands, and some of the Scottish islands, might be greatly increased, and their down yield a considerable revenue; but at present their eggs are indiscrimi-

## EIDER.

nately taken with those of other sea-birds, and no protection is extended to them. The eggs are remarkably fine. The flesh of the birds, also, is not unpleasant, and is said to become of superior excellence when they are partially domesticated, and when farinaceous food is mixed in considerable quantity with their natural diet of marine mollusks crustaceans, etc. The complete domestication of the E. has been successfully attempted, where access could be obtained to the sea.

About half a pound of eiderdown is said to be annually obtained from each nest, but this is reduced by cleaning to a quarter of a pound. The elasticity of the down is such that three-quarters of an ounce of it will fill a large hat, although two or three pounds of it may be pressed into a ball and held in the hand. Its extensive use, particularly in Germany and other parts of the continent of Europe, for stuffing the bed-coverings, which there usually supply



King Eider (*Somateria spectabilis*).

the place of blankets, etc., is well known. The down taken from birds which have been killed is inferior in quality to that obtained from the nests. The latter is known in commerce as *live down*, the former as *dead down*.

The KING EIDER, or KING DUCK (*S. spectabilis*), also yields no inconsiderable part of the eider-down of commerce, especially of that which is brought from the Danish towns in Greenland. This bird is circumpolar, and in winter occurs sometimes s. to New York. Its squarish frontal processes bulge angularly out of line with the ridge of the bill.—Three other species are found on our Northwest coast: STELLER'S E. (*S. stelleri*), with a violet speculum, and the bill (without frontal process) not feathered to the nostrils; the SPECTACLED E. (*S. fischeri*), with black-bordered, puffy, white feathers around the eye; and the PACIFIC E. (*S. v-nigrum*) of the arctic and n. Pacific coast, perhaps only a variety of *S. mollissima*, like it and the



## EIDLITZ-EIFFEL TOWER.

King E., with a forked throat-patch. Skins of king ducks are made into winter garments by the inhabitants of Siberia and Kamtchatka.

**EIDLITZ**, *īd'łīts*, 'LEOPOLD: architect: b. Prague, 1823, Mar. 29. He was educated in Prague and Vienna; engaged in business as an architect in New York; and designed Christ Church, St. Louis; St. George's Church, New York; Acad. of Music, Brooklyn; and the Dry Dock and Continental bank buildings, New York; and prepared plans for the completion of the Capitol, Albany.—His son, **CYRUS LAZELLE WARNER E.**, architect, b. New York, 1853, July 27, was educated in the United States and abroad, and designed the Michigan Central railroad depot, Detroit (1880); the Dearborn depot, Chicago (1883), and the Public Library, Buffalo (1888).

**EIDOGRAPH**, n. *ī'do-graf* [Gr. *eidos*, form, appearance; *graphō*, write, I draw]: instrument for copying drawing, invented by Prof. Wallace.

**EIDOLON**, n. *ī-dō'lon* [Gr. *eidōlon* — from *eidos*, that which is seen; likeness]: image, likeness, or representation; an apparition; an appearance.

**EIDOSCOPE**, n. *ī'do-skōp* [Gr. *eidos*, form, appearance; *skopeō*, I see]: instrument on the principle of the kaleidoscope, which produces an infinite variety of geometrical figures by the independent revolution of two perforated metallic disks on their axes.

**EIDOURANION**, n. *ī-dow-rā'nī-ōn* [Gr. *eidos*, form, appearance, and *ouranos*, the heaven]: representation of the heavens.

**EIFFEL**, n. *ī'fēl*: a district on the lower Rhine celebrated in geology for its recent volcanic rocks, its brown coal, and other deposits, and for its fossils.

**EIFFEL TOWER**, *ī'fēl*: designed by Gustave Eiffel, French engineer, b. Dijon, 1843, designer and builder of the Bordeaux bridge, Garabit viaduct, and other great engineering works; erected in the Champs de Mars, Paris, in connection with the international exhibition 1889. The form of the tower is that of a square of four arches, sloping inward and upward to a platform from which rises an airy, graceful column of open ironwork, from four feet, sloping somewhat like a lighthouse, and terminating in a small domed apartment, displaying the French flag in daytime and a powerful electric light at night. It is 984 ft. high, and cost \$1,300,000, to which the govt. contributed \$300,000, the remainder being furnished by an incorporated company, authorized to operate it for 20 years, after which it becomes the property of the state. Its great height will be best realized by comparison with other well-known structures, viz: Washington monument, 555 ft.; City Hall, Philadelphia, 535; Cologne Cathedral, 511; St. Stephen's Cathedral, Vienna, 470; Strásburg Cathedral, 468; Great Pyramid, 450; St. Peter's Cathedral, Rome, 448; St. Paul's Cathedral, London, 404; and Bartholdi's Statue of Liberty, 329. The work of constructing the tower began 1887, Jan. 28; more than 5 months were occupied in laying

## EIGHT—EIKON BASILIKÉ.

the foundations; work on the iron superstructure was begun June 30; the second platform was reached 1888, July 14; and the whole was completed 1889, April. The limit of vision from the top of the tower in clear weather is 40 m., which takes in Fontainebleau, Mantes, and Pontoise. The tower was fitted with American elevators, of novel shape and construction. The great work proved to be almost the chief attraction of the exhibition, and the receipts from its patrons during the time of the exhibition amounted to its cost, less a few francs. Though constructed with the primary object of showing to the world what French engineers could do, the designer had the ultimate object of providing a durable and exceptional meteorological station. As the tower was projected for a permanent structure, it will enable scientists to study the decrease of temperature at different heights, observe the variations of the wind at hitherto inaccessible points, discover the quantity of rainfall and the density of the clouds at various altitudes, and to study the laws of refraction and the physical aspect of the moon, planets, and nebulae under most favorable conditions.

**EIGHT**, n. *āt* [Icel. *átta*; Skr. *astan*; L. *octo*; Goth. *ahtau*; Ger. *acht*; AS. *eahta*, eight]: twice four; four and four. **EIGHTEEN**, n. *ā'tēn* [*eight* and *ten*]: twice nine; eight and ten. **EIGHTEENTH**, a. *ā'tēnth*, after seventeenth. **EIGH'TEEN'MO**, n. [*mo*, the added termination of L. *dēcīmō*: *ten* and *eighteen*]: a size of a book; a sheet formed into eighteen leaves: see **PAPER**. **EIGHT-FOIL**, in *heraldry*, a grass having eight leaves, as the trefoil has three. **EIGHT'-FOLD**, a. eight times the number or quantity. **EIGHTH**, a. *ātth*, next after seventh: N. a musical interval of five tones and two semitones. **EIGHTHLY**, ad. *ātth'ly*. **EIGHTY**, n. or a. *ā'tī* [AS. *eahta*, eight; *tig*, a collection of *tens*—the termination *teen* indicating addition, and *ty* multiplication]: eight times ten. **EIGHTIETH**, a. *ā'tī-ēth*, next after seventy ninth. **EIGHT'SCORE**, n. eight times twenty: see **SCORE**. **PIECE OF EIGHT**, former popular name of the Spanish dollar, as divided into eight reals.

**EIK**, *ēk*: in the legal phraseology of Scotland, addition made to a document for the purpose of meeting circumstances which have subsequently arisen.

**EIKON BASILIKÉ**, *ī'kon ba-sīl'ī-kē* (Likeness of a King): a work formerly presumed to have been written by Charles I. during his confinement, but now more correctly imputed to another writer. The following are the explanations of M. Guizot on the subject, in his *History of Oliver Cromwell and the English Commonwealth*. 'It is to the *Eikon Basiliké* that Charles I. is principally indebted for the name of the Royal Martyr. The work is not by him; external testimony and internal evidence both combine to remove all doubt on the matter. Dr. Gauden, bp., first of Exeter and afterward of Worcester, under the reign of Charles II., was its real author; but the manuscript had probably been perused and approved, perhaps even corrected, by Charles himself during his residence in the

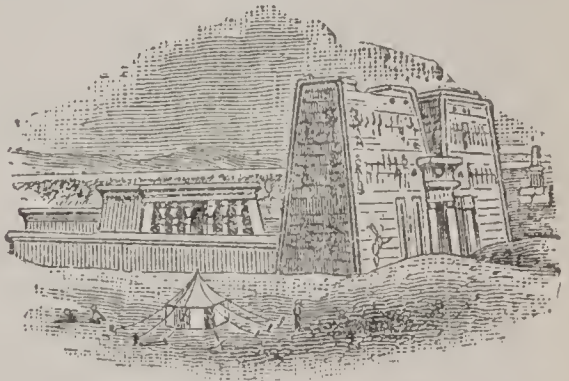




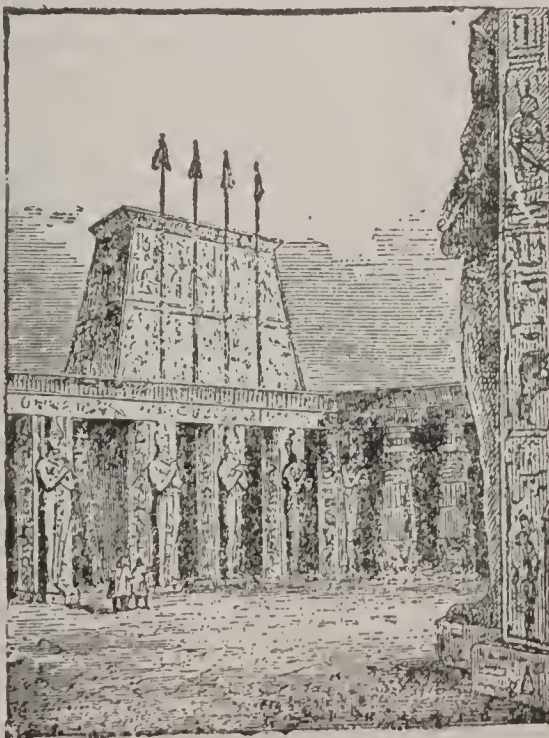
**Egypt.**—Statue of Khafra



**Egypt.**—Egyptian Columns: 1, From Rhamession, Thebes; 2, Portico of Temple at Dendera; 3, In British Museum.



**Egypt.**—Temple of Apollinopolis Magna (modern name, Edoon).



**Egypt.**—Court of Temple at Edfou.

## EILDON HILLS--EIMBECK.

Isle of Wight. In any case, it was the real expression and true portraiture of his position, character, and mind, as they had been formed by misfortune; it is remarkable for an elevation of thought which is at once natural and strained; a constant mingling of blind royal pride and sincere Christian humility; heart-impulses struggling against habits of obstinate self-consciousness; true piety in the midst of misguided conduct; invincible, though somewhat inert devotion to his faith, his honor, and his rank; and as all these sentiments are expressed in monotonous language, which, though often emphatic, is always grave, tranquil, and even unctuous, with serenity and sadness, it is not surprising that such a work should have profoundly affected all royalist hearts, and easily persuaded them that it was the king himself who addressed them.' The view that Charles was the author is, however, still maintained by some. See new editions of the E. B. 1880 by Scott and Phillimore; and the *Athenæum* of 1880. See GAUDEN, JOHN.

EILDON HILLS, *ēl'don*: isolated range, with three conical summits, near Melrose, Roxburghshire, Scotland. The central peak, 1,385 ft. high, commands a very wide and impressive view. See RAYMER.

EILENBURG, *ī'lēn-bûrg*: town of Prussian Saxony, on an island in the river Mulde, 26 m. e.n.e. of Merseburg. The manufactures of E. consist of calico, woolen yarn, tobacco, chemicals, beer, and agricultural implements. Pop. (1880) 10,654.; (1885) 11,032; (1890) 12,447.

EILETHY'IA: city of Egypt, anciently Nuben, and known at present by the name of El Kab. The town was anciently walled. The present ruins consist of the remains of small temples dedicated by Rameses II. to Ra; a Ptolemaic temple dedicated to the Eponymous goddess by Physcon or Euergetes II., with additions by Ptolemy Alexander I., and Cleopatra; and another temple dedicated by Amenophis III. to the local deities. The names of other monarchs are also found in the ruins; but the most interesting and important remains are the rock-tombs excavated in the vicinity. That of Aahmes-Pensuben, a functionary, records his military services in the wars of the early monarchs of the 18th dynasty against the Shosor Shepherds, and other Asiatic and Nigritic races. Another, of Pahri, is decorated with paintings representing the pursuits of agriculture. Swine were sacred to the local goddess. The town itself, during the 18th dynasty, appears to have been governed by princes, and some of the tombs appear as late as the 19th and 20th dynasties.—Wilkinson, *Modern Egypt*, II. 270; Champollion, *Notice Descriptive*, p. 265; Brugsch, *Reiseberichte aus Aegypten*, p. 214.

EIMBECK, *īm'bēk*, or EINBECK, *īn'bēk*: old town of Hanover, on the Ilme, 40 m. s.s.e. from Hanover; lat. 51° 49' n., long. 9° 50' e. It was a place of considerable importance in the 15th c., and was a Hanse city, but has decayed greatly in recent times. The minster is large and beautiful. The houses of E. are antiquated; its



## EIMEO—EISENACH.

streets narrow, tortuous, and badly paved. One portion of the town, however, burned down in 1826, has been rebuilt in a greatly improved manner. E. has manufactures of woollens, cottons, and linens, and chemical products; and has distilleries, breweries, tanneries, and tobacco-factories. E. owes its origin to the pilgrimages made to the Chapel of the Holy Blood, founded here 1080, by Count Alexander von Darul. Pop. (1890) 7,676.

EIMEO, *ī'mē-ō*: one of the Society Islands, in the Pacific Ocean, lat. 17° 30' s., and long. 150° 10' w., about 30 m. w.n.w. of Tahiti, the principal member of the group. It measures nine miles by five, and consists of deep valleys and abrupt hills—the former well cultivated, the latter heavily timbered. It is worthy of notice chiefly as the cradle of Polynesian Christianity. Here, in or about 1814, occurred the first popular manifestation in favor of the new religion; and here was established, as an instrument of evangelization, the South Sea College of the London Missionary Society. Pop. abt. 1,500.

EINSIEDELN, *īn'zē-dēln*: small town of Switzerland, in the canton of Schwytz, 9 m. n.n.e. of the town of Schwytz. It is notable for its Benedictine Abbey, containing a black image of the Virgin, to which about 150,000 pilgrims annually repair. The town has 55 inns and 20 ale-houses, supported chiefly by the pilgrims. The dedication festival of the abbey, Sep. 14, is the great pilgrimage season. The present abbey, one of the finest in Switzerland, was built at the beginning of the 18th c., and is the fifth since the foundation of the abbey, in the 10th c. Its treasury was rifled by the French 1798. Pop. (1888) 8,512.

EIRE, or EYRE, *ār*, JUSTICES IN: (corruption of Lat. *in itinere*). By this term, both in England and Scotland, were the judges of assize (q.v.) formerly designated. Justices in eire were first established in England by the statute of Northampton (1176), in the reign of Henry II. At first, they made the circuit of the kingdom once in seven years; but by Magna Charta, c 12, the chief-justices are directed to send justices through every county once in the year.

EISEL, n. *ē'sēl* or *ī'sēl* [AS. *eisile*; OF. *aisil*, vinegar]. in *OE.*, wormwood wine; vinegar; any acid.

EISENACH, *ī'zēn-āch*: town of Germany, Saxe-Weimar, beautifully situated amid finely wooded hills on the Hörsel, 45 m. w. from Weimar. Once the cap. of a principality to which it gave name, E. is still prosperous and industrious, and is well built, with wide, clean, and well-paved streets. E. has a ducal palace, a large and handsome building, now used as a court-house; a spacious market-place, including a handsome civic school; numerous churches; and a school of design. Its manufactures are woollen, cotton, and linen goods, soap, white-lead, meerschäum pipe bowls, leather, and carpets; there are also breweries and tanneries, and oil, powder, and spinning-mills. Pop. (1880) 18,624; (1890) 21,399.

On a lofty eminence in the immediate vicinity, sur-

## EISENBERG—EISENSTADT.

rounded by forests, and finely restored since 1847, stands the castle of Wartburg, former residence of the landgraves of Thuringia, and noted as the spot where the Minnesingers (q.v.) assembled to hold a trial of skill 1207, but chiefly as being the asylum to which Luther, at a time of great danger, was carried by his friend the Elector of Saxony, who, waylaying the great reformer, seized him, with an appearance of violence, and hurried him to this fastness, where he remained in safety, 1521, May—1522, March. The chapel in which Luther preached, as well as the chamber which he inhabited, and in which he discomfited the Evil One by throwing the inkstand at his head, is still pointed out. Another portion of the castle contains a fine armory, with suits of the 16th and 17th, and even, it is said, of the 13th and 14th c.

**EISENBERG** *ī'zén-běrch* (Ger. Iron Mountain): small town of Germany, in the duchy of Saxe-Altenburg, on an eminence near the Saale, 26 m. of Weimar. It is well built, its chief edifices being the castle, the observatory, the lyceum, and the town-house. E. has manufactures of woolens, porcelain, and earthenware, and has five annual fairs. Pop. (1880) 6,277; (1890) 7,349.

**EISENERZ**, *ī'zén-ěrts*: small town of Austria, in the n. of the province of Styria, 20 m. w.n.w. of Bruck. Its appearance is dirty and unprepossessing, and it is notable only for its connection with the Erzberg (ore mountain), at the s. base of which the town lies. This mountain, about 5,000 ft. high, and about five miles in circumference at the base, is literally a solid mass of iron ore, of a quality so rich, that, instead of cutting mines into it and following the metal in veins—which process was formerly adopted here—the top and sides of the rock are quarried from the outside, and the ore is then broken small, and conveyed to the smelting-house without further preparation. Mines have been worked on this mountain for upward of 1,000 years. Arragonite (*Eisenblüte*, or *Flos ferri*), resembling branching coral in form, and of the most beautiful and purest white, is found in grottoes in the interior of the mountain.\* Nowhere else does it occur in equal perfection. In 1884 the output of ore was more than 270,000 tons, yielding 40 per cent. of metal. Pop. (1880) 1,950; (1890) 2,433.

**EISENSTADT**, *ī'zén-stát*: free town of e. Hungary; lat. 47° 50' n., and long. 16° 30' e., 12 m. n.n.w. of Oedenburg. It is walled, has two gates, and consists principally of three main streets. It has also a Franciscan monastery, containing the burial-vault of the Esterhazy family, proprietors of the palace which is the chief architectural feature of Eisenstadt; built 1683, altered and enlarged 1805. It contains 200 chambers for guests, and has a saloon sufficiently large to dine 1,000 people. Its library contains a magnificent collection of church-music—masses, litanies, oratorios, etc., with some of Handel's mms. In the suburbs is a conservatory, one of the largest in Europe, containing 70,000 specimens of exotic plants. The Magyar name of E. is *Kis-Martón*. Pop. (1890) 2,845.



## EISLEBEN—EJECTMENT.

**EISLEBEN**, *is'lä-bén*: town of Prussian Saxony, about 20 m. w. of Halle. E., once cap. of the counts of Mansfeld, is the centre of a rich mining district, and consists of old town, new town, and suburbs. E. makes large quantities of beer, and has manufactories of potash and tobacco; in the vicinity are copper and silver mines, producing yearly about 1,000 tons of copper, and 25 tons of silver. Pop. (1890) 23,897. Here, 1483, Nov. 10, Luther was born, and here also he died, 1546, Feb. 16. The house in which he was born was partially consumed by fire 1689, but a remnant of it is extant, having the portrait of Luther over the entrance. In 1883, 400th anniversary of Luther's birth, a bronze statue of him was erected and a new gymnasium opened.

**EISTEDDFODD**, n. *is-těth'vōd* [W.—from *eistedd*, to sit; *bod*, in composition; *fod*, to be]: in *Wales*, a congress of bards, minstrels, and *literati*, for competition in national minstrelsy: see **BARD**: **WELSH LANGUAGE AND LITERATURE**.

**EITHER**, a. *ē'thēr* or *ī'thēr* [AS. *ægther*, any one of two—the prefix *æg* in composition signifying ever, always: Dut. *ieder*, every, each: comp. Esthon. *igga*; Lap. *ikke*, ever, all]: one of two; one or the other: **CONJ.** introductory word or correlative to *or*—as, he is *either* a rogue *or* a fool.

**EJACULATE**, v. *ě-jăk'û-lăt* [L. *ejaculātus*, cast or thrown out—from *ex*, out of; *jăcūlor*, I throw or dart; *jăcūlum*, a javelin, a dart]: to utter a few words suddenly, as a prayer; to exclaim earnestly but briefly. **EJAC'ULATING**, imp. **EJAC'ULATED**, pp. **EJAC'ULA'TION**, n. *-lă'shŭn* [F.—L.]: the uttering of a short prayer; the prayer itself; a short sudden exclamation. **EJAC'ULA'TORY**, a. *-lă'tēr-ī*, suddenly spoken or uttered in short sentences.

**EJECT**, v. *ě-jěkt'* [L. *ejectus*, cast out, expelled—from *ex*, out of; *jăciō*, I throw]: to cast or throw out; to void; to discharge; to evacuate; to turn out; to dismiss from an office; to expel. **EJEC'TING**, imp. **EJEC'TED**, pp. **EJEC'TOR**, n. *-tēr*, one who. **EJEC'TION**, n. *-jěk'shŭn*, the act of throwing or casting out; expulsion. **EJECT'MENT**, n. *-jěkt'měnt*, a dispossession; in *law*, a writ for the recovery of possession of land.

**EJECT'MENT, ACTION OF** (*Ejectio firmæ*), in Law: 'a possessory action, wherein the title to lands and tenements may be tried, and the possession recovered, in all cases where the party claiming title has a right of entry.'—Selwyn's *Nisi Prius*. 'The action of ejectment,' says Lord Mansfield, 'is the creature of Westminster Hall, introduced within time of memory, and molded gradually into a course of practice by rules of the courts.'—*Fairclain & Fowler v. Shamtitle*. 3 Burr. 1292. According to the strict rules of common law, a person dispossessed of his property in land, etc., was obliged to enforce his right by one of the forms of real action (q.v.) now abolished. This process being tedious, the action of E. was adopted for establishing title to land, and a marvellous line of legal fictions was in use through several centuries. In 1852 all these were

swept away. The action now commences by a simple writ addressed to the tenant in possession, and 'to all persons entitled to defend the possession,' setting forth that the plaintiff has asserted a claim to the land, and calling upon those interested to appear within a certain time to defend their right. The writ also contains a notice that, in default of appearance, the tenant in possession will be ejected. On appearance being made, issue is joined, and the cause proceeds as in ordinary actions. Judgment in ejectment will not carry the mesne profits or rents. In some cases of forcible entry, justices of the peace can also summarily eject the intruder and give possession. See EVICTION.

In the United States—at least in some of the states—action for ejectment follows the present English procedure, which, however, cannot be called English precedent, as in N. Y. the basis laid by the reform in England, 1852, was established 1830. Though judgment in ejectment does not carry recovery of the profits or rents, its supplies cause for another action by plaintiff (action of trespass for intermediate profits) for such recovery. In some states the two causes may be joined in one action at law.

EJOO: see GOMUTO.

EJUTLA, *ā-čhút'lá*: town of Mexico, province of Oajaca, 250 m. s.s.e. of Mexico city. Pop. 7,500.

EKATERINBURG, *ā-kā-tā-rēn-búrg'*: fortified town of Russia, province of Perm, on the e. slope of the Ural Mountains, on both banks of the Isset; lat. 56° 50' n., long. 60° 7' e. It is well-built, its streets long and straight, but unpaved, though having plank footpaths. The majority of the houses are of wood, but there are also many very handsome stone buildings. In the s. portion of the town, connected with the n. by a fine bridge, are the govt. magazines, the mills, factories, and the market-place. The opposite side, however, is the handsomer. It contains the dwellings of the mine-proprietors and of the merchants, and is laid out in elegant and spacious streets. E. is the seat of administration for the Ural mines, and is in the centre of the mining districts of these mountains. It has a museum of mineralogy, an excellent chemical laboratory, a school for educating miners, an imperial mint, numerous works for cleansing and amalgamating metals, and for cutting and polishing precious stones. The greater number of the inhabitants are supported by the productiveness of the neighboring mines. E. stands on the high road between Russia and Siberia, and is therefore a place of brisk trade. In the vicinity are the gold mines of Niviansk and Beresoff. E. was founded by Peter the Great 1723. Its average temperature during the year is 31° 9'. Pop. (1897) 55,488.

EKATERINODAR, *ā-kā-tā-rē-nō-dār'*: town of Russia, cap. of the country of the Cossacks of the Black Sea; on the right bank of the river Kuban, about 100 m. from its mouth; lat. 45° 5' n., long. 39° e. It is surrounded on all sides by swamp and morass. Its houses are almost all of earth, have thatched roofs, and are of one story in height. The streets are broad, regular, and straight, but exceedingly



# EKATERINOGRAD—EKHMIN.

dirty. E. has a cathedral with 6 wooden towers, and a wooden fortress. Pop. (1880) 32,300; (1897) 65,697.

**EKATERINOGRAD**, *ā-kā-tā-rē-nō-grād'*: town and fortress in the s. of Russia, in the govt. of Caucasus; on the left bank of the Terek; lat. 43° 40' n., and long 44° 3' e. It is an important military post of the Cossacks; its houses are regular, but miserably built. A stone triumphal arch was erected at E. by Catharine II., in memory of Prince Potemkin, who founded the town, 1777. Pheasants abound here, and form a principal article of food. Pop. about 3,000.

**EKATERINOSLAV**, *ā-kā-tā-rē-nō-slāv'*: government in Russia, province of s. Russia, bounded on the n. by Little Russia, and on the s., reaching in one part to the shores of the Sea of Azov. E., with that isolated portion of it which lies on the e. border of the Sea of Azov, and comprises the dist. of Taganrog and the country of the Azovian Cossacks, has, in all, 26,050 sq. m. Only about one-third of the entire area is cultivable, the remainder being desert (see STEPPE). The climate is mild, and a great many highly esteemed fruits, as apricots, peaches, cherries, etc., which do not occur in the more n. parts of Russia, are found here. E. has deep and extensive beds of coal. Though in 1870 not more than fifty tons were raised, the quantity within three or four years increased to many thousand tons annually. Pop. (1879) 1,532,045; (1897) 2,112,652.

**EKATERINOSLAV**: fortified town of s. Russia, on the right bank of the Dnieper, 250 m. n.e. from Odessa; lat. 48° 27' n., long. 35° 5' e. It was founded 1787 by Empress Catharine II. The streets are long and broad, but not clean. E. has manufactures of silk and woolen goods, and an important annual wool-fair. It is the residence of an archbishop. In the vicinity is a palace, now in ruinous condition, formerly the residence of Prince Potemkin. Pop. (1880) 33,973; (1890) 46,876; (1897) 121,216.

**EKE**, v. *ēk* [Goth. *auk*; Icel. *og*; Ger. *auch*, also: AS. *ēcan*; Goth. *aukan*; Icel. *auka*. to eke, to augment: L. *augēre*, to increase]: to add to; to enlarge; to lengthen; to protract; to spin out: AD. likewise; in addition; also, E'KING, imp.: N. increase. EKED, pp. *ēkt*.

**EKEBERGIA**, n. *ēk-ē-bēr-jǎ-a* [named by the African traveller Sparmann, after his relative, Capt. C. Gustavus *Ekeberg*, a Swedish captain, who took him to China]: in bot., genus of plants, order *Meliaceæ*, tribe *Trichilieæ*. *E. capensis* is a very ornamental tree about 20 ft. high, sometimes cultivated in greenhouses.

**EKEBERGITE**, n. *ēk-ē-bēr-jīt* [named 1824 after *Ekeberg*, who analyzed it 1807]: tetragonal, transparent, or translucent mineral; found in Sweden, Norway, Finland, and N. Y. Two varieties of it are passauite and paralogite. The *British Museum Catalogue* reduces Ekebergite to a variety of scapolite (q.v.), while Dana uses scapolite in a more extensive sense for a group of minerals.

**EKHMIN**, *ēch-mēn'*, or АХИМИН, *āch-mēm'*: town of

## EKMANITE—ELÆOCARPACEÆ.

Upper Egypt, near the right bank of the Nile, on the site of the ancient *Chemmis*, or *Panopolis*, one of the great cities of the Thebaid. Remains of ancient buildings are found. Pop. 4,000.

**EKMANITE**, n. *ĕk-man'it* [Ger. *ekmanit*: named after G. *Elkmann*, proprietor of the mine in which it was found]: a Swedish mineral of the chlorite group.

**EKRON**, *ĕk'ron*: one of the 5 cities of Philistia; Judah's portion of the territory distributed by Joshua; in the s. part of Palestine; 10 m. e. of the Mediterranean, 15 m. s.e. of Jaffa, 25 m. n.w. of Jerusalem; near the right bank of the Wady-es-Surar. Beelzebub was openly worshipped there, its inhabitants were denounced severely by the prophets, and the ark was taken there after its capture by the Philistines. The ancient city is supposed to have been built with unburnt bricks, and its site is now occupied by the town of Akir or Akree.

**ELABORATE**, v. *ĕ-lăb'ō răt* [L. *elabōrātus*, labored, taken pains with—from *ex*, out; *labōrō*, I toil: It. *elaborare*: F. *élaborer*]: to improve or highly finish by successive operations: **ADJ.** highly finished; complicated. **ELAB'ORATING**, imp. **ELAB'ORATED**, pp. produced with labor or study. **ELAB'ORATELY**, ad. *-lī*. **ELAB'ORATENESS**, n., or **ELAB'ORA'TION**, n. *-ră'shŭn* [F.—L.]: the act of finishing with great care; the improvement which results from this care. **ELAB'ORA'TOR**, n. *-tér*, one who.—**SYN.** of 'elaborate, a.': high-wrought; labored; prepared; studied; perfected.

**ELÆAGIA**, n. *ĕl-ĕ-ăj'ĭ-a* [Gr. *elaia*, the olive tree, and *hagios*, devoted to the gods, sacred]: in *bot.*, genus of *Cinchonaceæ*. *E. utilis*, is the wax or varnish tree of the Cordilleras.

**ELÆAGNUS**, *ĕl-ĕ-ăg'nŭs*: genus of exogenous plants, of the nat. ord. *Elæagnaceæ*. This order consists of trees and shrubs, usually covered with scurfy scales. The Buffalo Berry (*Shepherdia argentea*) of the upper Missouri region, 12–18 ft. high, with 8-stamened flowers, has leaves with silvery scales, and small, scarlet, well-flavored fruit. *S. canadensis*, also thorny, a fine shrub, has stellate hairs. The Silver Berry (*E. argentea*), Vt. to Wis. and n., is a beautiful shrub, with reddish branches and silvery leaves, having rusty scales. The Sallowthorn (q.v.) is the only British species. *E. angustifolia*, the Oleaster, sometimes called Wild Olive, is a native of the s. of Europe and the Levant, a spiny tree 15–20 ft. in height, with lanceolate leaves, which, as well as the young shoots, are hoary with stellate hairs. It is planted in some more northern countries for its silvery white foliage, beautifully contrasting with the green of other trees, and its very fragrant flowers, which are small and of a dull yellow color.

**ELÆ'IS**: see OIL PALM.

**ELÆOCARPACEÆ**, *ĕl-ĕ-ō-kăr-pă'sē-ē*: according to some botanists, a nat. ord. of exogenous plants, but regarded by others as merely a sub-order of *Tiliaceæ*. the chief dis-



## ELÆOCOCCA—ELÆODENDRON.

tinctions being deeply cut or fringed petals and anthers opening at the apex. The E. are mostly E. Indian trees. The fruits of some are eaten; those of some are dried and put into curries; those of *Elæocarpus serratus* are pickled in brine and eaten with oil in Ceylon, and much resemble olives. *E. cyaneus*, is a native of New Holland. The deeply wrinkled seeds or stones of the fruit of some, particularly *Elæocarpus ganitrus* and *Monocera tuberculata*, being very hard, and having a fine sculptured appearance, are made into beads for necklaces and bracelets, and are sometimes



*Elæocarpus Cyaneus*:

*a*, magnified flower; *b*, petal; *c*, stamens; *d*, ripe fruit;  
*e*, same cut away, showing wrinkled seed.

set in gold. They are called often OLIVE NUTS. These beads are frequently worn by religious devotees in India, and sometimes sold as ornaments in the shops of Europe.

ELÆOCOCCA, *ël-ê-ô-kôk'ka*: genus of *Euphorbiaceæ*, the seeds of some of which yield useful oils. The oil obtained from *E. verrucosa* is used for food in Japan, notwithstanding considerable acidity. The tree is cultivated in the Mauritius, and the oil is there used only for burning. That obtained from *E. vernicia* is used in painting in China.

ELÆODENDRON, *ël-ê-ô-dên'dron*: genus of trees of the nat. ord. *Celastraceæ*, having a 5-partite calyx, 5 petals, a 5-angled disk, 5 stamens, the ovary immersed in the disk, and a drupaceous fruit. *E. glaucum*, native of Ceylon and the s. of India, is called sometimes the *Ceylon Tea-tree*, from the resemblance of its leaves to those of the tea-shrub. The timber of *E. croceum*, called SAFFRON-WOOD at the Cape of Good Hope, is much used there in building and cabinet-making; it is fine-grained, hard, and tough. The

## ELÆOLITE—ELAND.

fruit of *E. Kubu*, another s. African species, is eaten by the colonists. That of *E. Argan* yields an oil similar to olive oil, much used by the Moors.

**ELÆOLITE**, n. *ē-lē'ō-līt* [Gr. *elaion*, oil; *lithos*, a stone]; a mineral of the scapolite family having a fatty resinous lustre.

**ELÆOSELINUM**, n. *ēl-ē-ō-sē-lī'nūm* [Gr. *elaia*, the olive, and *selinon*, a kind of parsley]: in bot., genus of *Apiaceæ*, typical of the family *Elaeoselinidæ*.

**ELAGABALUS**, *ēl-a-gāb'a-lūs* or *ēl-a-ga-bā'lūs*, or **HELIOGABALUS**, *hē-lī-ō-gāb'a-lūs* or *hē-lī-ō-ga-bā'lūs*, Emperor of Rome: 204–222 (reigned 218–222); b. Emesa. His real name was Varius Avitus Bassianus, but having, when a mere child, been appointed high-priest of the Syro-Phenician sun-god Elagabal, he assumed the name of that deity. Soon after the death of his cousin Caracalla, E. was proclaimed emperor by the soldiers, in opposition to the legitimate sovereign, Macrinus, who had become obnoxious to the troops from the severity of his discipline. The rivals met in battle at Antioch in 218. Macrinus was defeated, and E. quietly assumed the purple. His reign, which lasted rather more than three years and nine months, was infamous for the nearly unparalleled debaucheries of every kind in which he indulged. He was murdered in an insurrection of the prætorians and was succeeded by his cousin and adopted son, Alexander Severus.

**ELAINE**, or **ELAIN**, n. *ē-lā'in* [Gr. *elaion*, oil]; the liquid principle of oils and fats; a fat oil which remains liquid at ordinary temperatures—usually **OLEINE**, *ō-lē'in* (q. v.).

**ELAM**, *ē'lam*, or **SUSIANA**, *sō-sī-ā'nā*: part of the ancient empire of Persia, between Diyaleh river and the Persian Gulf on the n. and s., and the Kebir Kuh range of mountains and the Tigris river on the w. and e. The country is mountainous in the n., flat in the s., and marshy along the gulf coast, and the inhabitants are now as formerly nomadic in their habits. It is computed from cuneiform inscriptions that the Elamite dynasty was established in Chaldea about B.C. 2295. The Assyrian kings were continually at war with the people of E., who sought to establish their own independence. One king of E. conquered Babylonia, and 9 kings are mentioned in the inscriptions. The cap. was Shushan or Susa.

**ÉLAN**, n. *ā-lāng'* [F.]: a start; a leap; a bound; buoyancy of spirit.

**ELAND**, n. *ē'lānd* [Dut. *eland*; Ger. *elend*, the elk], (*Antilope Oreas*): largest species of antelope in south Africa, abounding wherever there are fertile plains and low hills, except in the longest settled and most cultivated parts of Cape Colony, where it has been too much hunted to be any longer abundant. It is described by Livingstone as 'the most magnificent of all antelopes.' It is one of those called sometimes *bovine* antelopes, because they seem to approximate in some of their characters to the ox-tribe,



## ELANET.

having a broader muzzle, less slender limbs, and greater bulkiness of form than the antelopes in general. The E., however, is very graceful and beautiful; it is as large as a horse, fully five ft. in height at the shoulder, and weighs from seven to nine cwt. The horns—in the male about a foot and a half long, and in the female longer and more slender—are almost straight, inclining backward and outward; they are pointed, and their great strength is increased by a spiral wreath. The E. has a large protuberance on the larynx, in this resembling the elk, from which, probably, on this account, it has derived its name. It is known also as the *Impoof* or *Impoofoo*. Its tail much resembles that of an ox, and terminates in a tuft of long black hair. It is gregarious and the herds are often large. It is generally very fat, and not difficult of pursuit, its



Eland (*Antilope Oreas*).

gentleness also increasing the facilities of the hunter. Its flesh is much esteemed, particularly the muscles of the thighs, which are dried like tongues. It is surprising that no attempt has been made to domesticate for useful purposes an animal very easy of domestication, and with so many valuable qualities.

Livingstone discovered a variety of the E. in regions n. of the Cape Colony, having the body marked with narrow white transverse bands. According to the figure given in his travels, it seems even more bovine in form than the common variety.

ELANET, *ē-lā'nět* or *ē'l'a-nět* (*Elanus*): genus of *Falconidae*, allied to the kites, which they resemble in many of their characters; but from which they differ in having the short tarsi half covered with feathers, and the claws, except that of the middle toe, rounded beneath. The tail is very little forked. One species (*E. melanopterus*) is common in Africa, from Egypt to the Cape of Good Hope, and is found also in India. Another species is the Black-

## ELAPHOMYCES—EL-ARABAH.

shouldered Hawk (*E. dispar*) of America, the n. limit of which appears to be S. Car. Both of these feed chiefly on



Elanet (*Elanus dispar*).

insects, which they catch on the wing, but they prey also on small birds and reptiles.

ELAPHOMYCES, n. ěl-a-fō'mĭ-sēz [Gr. *elaphos*, a deer]: genus of ascomycetous fungi.

ELAPHRIUM, n. ě-lā'frĭ-ŭm [Gr. *elaphria*, lightness]: genus of *Amyridaceæ*. *E. tomentosum*, has been said to furnish the balsamic bitter resin called Tacamahac; family *Burseridæ*.

ELAPHRUS, n. ěl'a-frŭs [Gr. *elaphros*, light]: genus of *Carabidæ*. They have prominent eyes.

ELAPIDAE: genus of serpents: see ELAPS.

ELAPS, ě'laps: genus of venomous serpents, inhabiting the warm parts of the world, chiefly the Indian islands, Australia, and tropical America. They are of slender cylindrical form, with elongated head, and often of bright and beautiful colors. They are not very agile, are said to prey chiefly on other reptiles, and live among the luxuriant vegetation of meadows or forests.

ELAPSE, v. ě-lăps' [L. *elapsus*, slipped or glided away—from *ex*, out of; *lapsus*, slipped or glided]: to pass away silently; to slide or slip away, applied to time. ELAP'SING, imp. ELAPSED', pp. -lăpsl'.

EL-ARABAH, ěl-â'râ-bâ: southern part of the deep valley that extends from Mount Hermon on the n. to the gulf of Akabah, or the eastern horn of the Red Sea. The n. part of this deep valley is called El-Ghor. The length of El-A. from the dividing ridge of chalk hills (Akrabbim) s. of the Dead Sea, to the gulf is about 100 m.; width at the gulf, less than four m.; 70 m. n. it is four times as wide. On its w. side the Tih hills rise by abrupt steps 1,500 ft. or more. The plateau at their summit is known as 'the desert of the wandering.' Up through them from



## EL-ARAISH—ELASTIC.

the valley there are two passes: one, near the gulf and very steep, is much used by the pilgrims to Mecca; the other, on the road from Petra to Hebron, and rising 1,000 ft. higher than the plateau is probably the path down which Israel, attempting (contrary to the Divine command) to go up to the promised land, was driven by the Amalekites. On the e. side of El-A. are the mountains of Edom which are green, and in many parts capable of cultivation. Mount Hor, the principal peak, is 5,000 ft. high. Abundant ruins of ancient towns remain. There are wadis (ravines) descending from the mountains, which supply water sufficient to irrigate the ground at least in part and at times. One of these, beginning near the head of the Red Sea, extends to Petra, and thence to the Dead Sea. A Roman road anciently went through it of which some traces remain. Another leads somewhat directly to Petra. As the n. division of the valley (El-Ghor) extends from the Dead Sea to Mount Hermon, forming the valley of the Jordan, many persons formerly supposed that the Jordan originally flowed on through El-A. to the gulf. But this theory has been disproved by the discovery of the fact that the Jordan and the Dead Sea are lower than the gulf. As to El-A. itself the waters of its n. part flow into the Dead Sea; those of the s. part, into the gulf.

EL ARAISH, *el-â-rîsh'*, or L'ARAISH, or LARACHE, *lâ-râsh'*: fortified town, province of Aygar, Morocco, on the Mediterranean at the mouth of the Luccos river or the wady El-A. It is the centre of important inland traffic between Egypt and Syria, has a handsome mosque and large market place, and it is the site of the ancient Egyptian penal colony of Rhinocolura. Pop. abt. 4,000.

ELASMOBRANCHII, *ē-lās-mō-brāng'kē-i*: name proposed by Bonaparte, now largely used for the order of fishes termed also *Chondropterygii* (see CARTILAGINOUS FISHES). The E. comprises the sharks, rays, and chimæras (q.v.); and is divided into two sub-orders, *Plagiostomata* and *Holocephala*.

ELASMOSAURIANS, *ē-lās-mō-saw'rĭ-anz*: genus of huge marine saurians of the cretaceous period, combining the characters of serpents, lizards, and plesiosaurs, described also as a kind of reptilian whales. One species had vertebræ as large as those of an elephant, the bulk of a whale, the neck long and flexible, the paddles short, and the tail serpent-like; a long, narrow, flat muzzle; spout holes, and long, sharp teeth. It attained a length of 45 ft., and its remains are found chiefly in New Jersey.

ELASMOTHERIUM, n., *ē-lās-mō-thē'rĭ-ŭm* [Gr. *elasma*, metal beaten out, and *thērion*, a wild animal]: in *paleon.*, a pachyderm, family *Rhinocerotidae*, found in the Post-pliocene beds in various parts of Europe.

ELASTIC, a. *ē-lās'tĭk* [F. *élastique*—from Gr. *elastikōs*, elastic; Gr. *elasma*, a plate of metal that has been hammered out—from *elauno*, I beat or draw out]: springing back; having the power to return to the form from which it is bent, drawn, or pressed. ELAS'TICALLY, ad. *-tĭ-kāl-ĭ*,

## ELASTICITY.

**ELASTICITY**, n. *el'ās-tis'ī-tī* [F. *élasticité*]: the power possessed by some bodies of returning to the position from which they are bent, drawn, or pressed. **ELAS'TIN**, n. *-tīn*, the chief constituent of elastic tissue in the body. **ELASTIC BITUMEN**, a mineral occurring in soft fungoid masses, with a resinous lustre, flexible and elastic. **ELASTIC-FLUID**, n. fluid which has the property of expanding in all directions after the removal of external pressure, as the air. **ELASTIC TISSUE**, known also as Yellow Fibrous Tissue, one of the forms of Fibrous Tissue (q.v.). It derives its name from the remarkable physical property which it possesses of permitting its fibres to be drawn out to double their length, and again returning to their original length. It occurs in various ligamentous and other structures of the animal body in which elasticity is required, as, for example, in the vocal chords, the membranes connecting the cartilaginous rings of the trachea, the middle coat of the arteries, the skin, etc.

**ELASTICITY**, or **SPRING**: power, in a substance, of returning to the position whence it has been bent, drawn, or pressed. When an external force acts upon a solid body, it produces at first slight alterations in the relative positions of the particles; and if before these alterations exceed a certain limit, the force ceases to act, the particles return to their former position, and the disfigurement disappears. This power or property of recovering the previous form after alteration, is called *E.*, and we are justified in ascribing it to all bodies, though in very different degrees. It was formerly believed that there were definite limits within which changes of form produced by pressure or other forces disappeared completely; for instance, that when a weight of no great magnitude is suspended from a metallic wire, the slight increase of length which the wire is observed to undergo, is completely lost when the weight is removed; and the limit to which the wire might thus be stretched, and still suffer no permanent increase of length, was called the limit of its *E.* But recent more accurate experiments have shown that no such limits exist, at least in the case of metals; or, which is the same thing, that permanent lengthening results, however slightly the wire be loaded—it never contracts again quite so far as it was stretched. It is necessary, therefore, to fix the limit arbitrarily; and this is done by agreeing that it shall be held to begin when the metal in question suffers a permanent elongation of 0·00005 of its length. To get the elastic extensibility of a wire, then, we must compare its length with a weight suspended, with its length when the weight is removed. In this way it is found that the extensions produced are proportional to the extending forces or weights. From this law we can calculate what weight it would require to stretch a wire or rod of a sq. inch in section to double its own length; supposing it possible to proceed so far without breaking it, and that the law of *E.* continued up to this point unaltered. This weight, different for every metal or kind of wood, is called the *coefficient* or *modulus of E.* of the particular substance; and



## ELASTICITY.

is used in mechanics in calculating how far a given weight will extend a wire or rod of given diameter. This coefficient is not constant for the same metal; for all circumstances that increase the density of the metal, increase the modulus of elasticity. Bodies manifest E. not only when extended in length, but also when compressed, when bent, or when twisted. If an ivory ball be dropped from a height upon a marble slab smeared with fat and lamp-black, when caught after the rebound, it is seen to have touched the marble, not in a point, but in a circle of several lines in diameter; and must therefore have lost for a time its spherical shape over that extent. In the same way the mark of a well hit golf-ball is broadly shown upon the face of a club after the stroke. The E. shown by wires and threads of glass when twisted, has been turned to account in the torsion-balance (q.v.), for measuring other weak forces. Steel, ivory, caoutchouc, etc., are well known for elastic properties, to which they owe much of their utility.

The propagation of waves of sound through solid bodies depends upon their E.; and from observations of this kind made with different substances, the modulus of E. for each may be deduced; the results, however, differ slightly from those arrived at by attaching weights, owing to the heat produced by the vibratory movement.

All solid bodies are only imperfectly elastic—that is, they do not quite recover their form and volume when the disturbing force ceases. Liquids and gases, on the contrary, are perfectly elastic, or return exactly to their original bulk or volume when the pressure is removed. The E. of liquids and gases, however, acts only in expanding after compression, while that of solids acts also in contracting after extension. The expansive E. of liquids and gases is equal to the force used to compress them. Water and other liquids are easily seen to be compressible, by the fact of their conveying sound—a sound-wave being merely a *state* of compression, propagated from each layer of the liquid to the next. The coefficient of E. of water determined by Colladon and Sturm, from the velocity of sound in the Lake of Geneva, agrees very well with that determined by direct measurements in Oersted's apparatus. The discovery of the compressibility of water is an English one, due to Canton, 1762. Previous attempts, by Italian and Dutch philosophers, to compress water by hammering a silver shell filled with that fluid, had failed to give any certain result, as the water was forced through the pores of the metal. At a temperature of  $50^{\circ}$ , one atmosphere compresses water to about 0.999995 of its volume. From the existence of maximum density temperature for water, some curious consequences arise with regard to the effects of pressure on the fluid. The volumes or bulks which a given quantity of any gas assumes under different pressures, are nearly in inverse proportion to the pressures: see MARIOTTE'S LAW. The E. of gases is measured usually by the height of the column of mercury that they sustain. The E. of gases is a force much and variously

employed in the arts of life: see AIR-GUN: AIR-PUMP. GUN-POWDER, etc.

ELATE, v. *ě lát'* [L. *elātūs*, raised, exalted—from *er*, out of; *lātus*, carried: It. *elato*]: to raise in spirits; to make proud; to elevate with success; to exalt: ADJ. flushed, as with success; proud; exalted. ELA'TING, imp. ELA'TED, pp.: ADJ. elevated in spirits, as with honor or success. ELATION, n. *ě-lā'shūn*, vanity or pride resulting from success; joyful elevation of mind. ELA'TEDLY, ad. -lī.—SYN. of 'elate, a.': lofty; haughty; puffed up.

ELATEA, *ě-l-ā-tě'ā* (anc. CYTHÆRON): range of mountains between Bœotia and Attica in Greece. The loftiest peak rises somewhat over 4,600 ft. above the sea.

ELATER, n. *ě-l-ā-tēr* [Gr. *elātēr*, a driver]: in bot., an elastic spirally twisted filament for dispersing the spores, as in some liverworts; the click-beetle. ELATERITE, n. *ě-lāt'-ēr-īt*, an elastic mineral pitch, called also *elastic bitumen* (see BITUMEN).

ELATER, *ě-l-ā-tēr* or *ě-lī'tēr*: Linnæan genus of coleopterous insects, now divided into many genera, and forming the tribe or family *Elateridæ*. They have a narrow elongated body; the head is in almost all cases inserted deeply into the thorax; a strong spine on the under part of the thorax at its base, fits into a groove; the legs are short and rather slender. They are generally found upon the flowers and leaves of plants, which are their food. When disturbed, they fold their legs and antennæ close to the body, and let themselves drop to the ground. If they fall on their back, or are placed on it, the shortness of their legs incapacitates them for obtaining another position by the means common to other insects; but they are enabled to do so by a violent muscular exertion, arching the body a little, and suddenly straightening it again, so that they fling themselves into the air with a jerk and a *click*. Hence the names CLICK-BEETLE (q.v.) and SKIP-JACK. The spine and groove of the thorax are supposed to be of use in this. The larvæ are long, rather slender, with six feet near the head, and a tough skin. Many feed on rotten wood; others, WIRE-WORMS (q.v.), on the roots of plants. Some of the *Elateridæ* of tropical regions diffuse from spots on the thorax a strong and beautiful light, and are called fire-flies (q.v.).

ELATERIUM, *ě-l-ā-tě'rī-ŭm*: a drug obtained from the fruit of the SQUIRTING CUCUMBER, or SPIRTING CUCUMBER (*Ecbalium agreste*, known formerly as *Momordica Elaterium*), called also Wild Cucumber, an annual plant of the nat. ord. Cucurbitaceæ, native of the s. of Europe, common on rubbish heaps in the villages of Greece and the Archipelago. The whole plant is rough, with stiff hairs; it has a trailing branching stem, without tendrils; the leaves are heart-shaped, somewhat lobed and toothed, on long stalks; the flowers axillary, yellow, the male flowers in small racemes; the fruit oblong, about an inch and a half long, grayish green, covered with soft prickles, and finally parting from its stalk, and expelling its seeds with



## ELATH—ELATINACEÆ.

a thin mucus through the aperture where the stalk was inserted. This remarkable phenomenon is ascribed to osmotic action within the fruit; a thin membrane separating a mucus which immediately surrounds the seeds from a less dense juice which abounds in the succulent part of the fruit, and the quantity of the former being gradually increased at the expense of the latter, till, on the perfect ripening of the fruit, the much distended central cell is opened, to permit its ejection. It is this mucus surrounding the seeds—a thick green mucus of a very peculiar character—which contains the elaterium. To obtain the drug, the juice of the nearly ripened fruit is allowed to stand for a short time, when it becomes turbid, and deposits a sediment. The sediment, carefully collected and dried, is elaterium. It is of a pale grayish-green color, light and friable, with an acrid taste, and a peculiar not unpleasant odor. It is an exceedingly powerful or drastic purgative, used chiefly in dropsies, and in very small often-repeated doses. It should not be used except under medical advice. It acts as an irritant not only on the eyes, if it comes in



Wild Cucumber (*Ecbalium agreste*).

contact with them, but even on the fingers of those who handle it. Its properties seem to depend chiefly on a crystalline principle called *Elaterine*. The use of E. was known to the ancients.

ELATH, *ē'lath*, or ELANE (now AILAH): town in Idumea, on the Elanitic gulf of the Red Sea; a station on the route between Cairo and Medina. From E, Solomon sent out his ships for trade with Ophir.

ELATINACEÆ, n. *ē-lăt-ĭ-nă'sē-ē* [Gr. *elatē*, the pine, from the resemblance of their leaves]: in *bot.*, water peppers; order of plants, alliance *Rutales*: see [RUTACEÆ.

## ELATMA—ELBE.

**ELATINE**, n. *ěl-a-ti'ně*, typical genus of the order *Elatinaceæ*.

**ELATMA**: see **JELATOM**.

**ELBA**, *ěl'bá* (Lat. *Ilva*, Gr. *Æthalia*): island belonging to the kingdom of Italy, in the Mediterranean Sea, between Corsica and the coast of Tuscany, from the latter of which it is separated by the channel of Piombino, a strait 5 m. in breadth. The island has abt. 85 sq. m.; greatest length about 18 m., breadth from 3 to 10 m., this irregularity being caused by indentations on its n. and s. shores. The coast is bold and precipitous. The surface is traversed from w. to e. by a chain of mountains, which divides into two spurs at the e. extremity of the island; the highest summit, Monte della Capana, rising 3,600 ft. above sea-level. These mountains are for the most part bare; but on their lower ridges, and in the valleys, the vine, olive, mulberry and other trees flourish. The climate, except in the low-lying districts on the shore, is temperate and healthful. There are few streams in E., but it has numerous wells. The principal products are wines, white, red, and sweet, and of good quality; wheat, Indian corn, vegetables, and water-melons. Fifty thousand cwts. of salt are produced annually from the salt-pans on the shore. Sheep, goats, pigs, and asses abound, but horned cattle and horses are scarce; the coasts supply fish plentifully. Iron of excellent quality is obtained from a mountain on the e. coast, 2 m. in circumference, 500 ft. in height; almost entirely a mass of ore, so rich that it yields from 50 to 75 per cent. E. yields also loadstone, alum, vitriol, and marble. Porto Ferrajo, capital and residence of the gov., has a pop. about 5,500. E. has been rendered famous in history from having been Napoleon's place of exile 1814, May—1815, Feb. Pop. (1881) 23,997.

**EL BASSAN**, *ěl-bás-sân'*, or **ALBASSAN**, *ál-*, or **ILBASSAN**, *il-*: town of Turkey, in the central part of Albania. Pop. 10,000.

**ELBE**, *ělb*, Ger. *ělběh* (called by the Romans *Albis*—i.e., white—and by the Bohemians *Labe*): important river of n. Europe. It originates in the confluence of numerous streams which rise at the s.w. base of the Schneekoppe (Snowcap), one of the highest summits of the Riesen-Gebirge, a mountain-range on the n. border of Bohemia. The course of the E. begins near lat. 50° 45' n., long 15° 36' e.; about 4,400 ft. above sea-level. Its total length, including windings, is estimated 700 to 720 m., and its basin at 56,000 sq. miles. The average depth is 10 ft., mean breadth 900 ft., though occasionally it has a width of upward of 1,000 ft., and at its mouth of several miles. In the course of its progress to the sea, it is joined by 17 rivers and upward of 70 smaller streams. From the base of the Schneekoppe, it flows s. to Pardubitz, then w. to Brandeis, and afterward in a general n.w. direction past Melnik, Leitmeritz, Aussig, and Tetschen, where it quits the Bohemian territory and enters Saxony. At this point, it is 355 ft. wide. Its principal affluent in Bohemia is the Moldau. On its course n.w.



through Saxony, the E. passes Pirna, Dresden, and Meissen, and entering Prussian Saxony, about 7 m. above Mühlberg, it advances to Torgau and Wittenberg, whence it flows first w., then n.w. to Magdeburg, receiving in its progress the Mulde and the Saale, both from the left. From Magdeburg flowing n.e., the E. arrives at the border of Brandenburg, receiving the Havel from the right; then turning n.w., it forms the boundary between Prussian Saxony and Brandenburg, and enters Hanover, through which it flows for upward of 30 m. Then still flowing n.w., it forms the boundary of Lauenburg, the Hamburg territory, and Holstein on the n., and Hanover on the s., until it empties into the North Sea at Cuxhaven, where it attains a breadth of upward of 10 miles. At this point, the tide rises 12 or 13 ft. The E. is divided into several branches between Hamburg on the n., and Harburg on the s., by the numerous islands that there interrupt its course. Vessels of 14 ft. draught can at all times ascend to Hamburg. The scenery of the valley of the E., though generally pleasing, is not remarkable, except between Aussig and Dresden. Between these two towns, the course of the E. is generally between bold cliffs, and high natural battlements of rock; the banks covered with foliage, wherever a tree can support itself; and occasionally varied by a strip of green glade. It has been said that here the E. has all the variety of the English Wye, on a scale nearly as majestic as that of the Rhine. Its waters are stocked with abundance of highly esteemed fish; beavers likewise build in the stream. Steam-boats ply from Dresden up the river, and down as far as Torgau, as well as from Magdeburg to the sea. The navigation of the E. was formerly impeded by all manner of imposts and monopolies; and sand was allowed to accumulate, so that vessels were often obliged to wait three or four weeks for want of sufficient water. The former of these impediments has of late years been gradually removed, till in 1870 all tolls were abolished, but something remains to be done toward improving the channel.

ELBERFELD, *él'ber-félt*: one of the most important manufacturing towns in Germany, on both sides of the Wupper, an affluent of the Rhine, 16 m. e.n.e. of Düsseldorf. Its site, in the narrow and hill-girt valley of the Wupper, is picturesque and healthful. The old parts of the town are poorly built, straggling, and irregular, but the newer portion is well built, with numerous spacious and imposing buildings, in a high architectural style. E. is noted chiefly for its dyeing, bleaching, and printing establishments, also for its extensive and important manufactures of cotton, silks, tapes, ribbons, merinos, fancy woolen goods, velvets, etc. Bleach-fields occupy a great part of the environs of E., and of the banks of the Wupper, the waters of which are said to have very valuable bleaching properties. At E., the well-known dye, Turkey red, is imparted to yarns, at a cheaper rate, and with more clearness and firmness of color, than at any other town in Europe. The patterns for the printed goods are designed

## ELBEUF—ELBOW.

at **Elberfeld**. E. supports, among its numerous educational institutions, an important establishment, in which young manufacturers and overseers are taught the management of the Jacquard-loom, pattern-drawing, etc. Like the rest of the Wupper valley, E. is notable for religious zeal and orthodoxy, E. is connected by a tramway with the neighboring town of Barmen (q.v.), also the seat of extensive manufactures. Pop. (1840) 31,500; (1880) 93,538, (1890) 125,830; (1900) 156,937.

**ELBEUF**, or **ELBŒUF**, *ël-béf*: manufacturing town or France, dept. of Seine-Inférieure, delightfully situated in a picturesque valley on the left bank of the Seine, about 75 m. n.w. from Paris. It was originally badly built, but has recently been greatly improved. Large factories have arisen rapidly; and a spacious market place (*champ de foire*), adorned with rows of chestnut-trees, has been erected. The two principal public buildings of E. are the churches of St. Etienne and St. Jean-Baptiste, both containing fine specimens of richly painted glass. The factories of E. and the vicinity exceed 200 in number; these are for the most part worked by steam-power, and give regular employment to more than the half of the population. The manufactures are principally double-milled and waterproof cloth, flannel fabrics, billiard table-covers, and light woollens of every color and description. E. has active steam communication with Paris, Havre, and Rouen. E., which has been called the Leeds of France, had 80 cloth manufactories as early as the 16th c. In consequence of the revocation of the Edict of Nantes, the greater number of the cloth manufacturers emigrated; and it was not till after the Revolution of 1789, since the separation of Belgium and France, that industry again began to flourish. Pop. (1881) 22,883; (1886) 21,829; (1896) 20,542.

**ELBING**, *ël'bīng*: trading and manufacturing town in w. Prussia, in a fertile valley, on the navigable river of the same name, 34 m. e.s.e. of Danzig, and 5 m. s. of the s.w. extremity of the Frisches Haff, into which the Elbing flows. It is connected by a canal with the Nogat, the e. arm of the Vistula. The town was formerly surrounded with walls and mounds, of which there are few remains. Of the numerous churches, the most remarkable is the Marienkirche, erected in the 14th c. The gymnasium, founded in 1536, contains the town library, 24,000 vols. There are likewise several well-conducted educational and charitable institutions. The manufactures are chiefly linen and cotton cloths, leather, tobacco, soap, and chicory. There are also oil manufactories, iron foundries, breweries, dye and print works. E. was founded about the beginning of the 13th c. by colonists from Lübeck and Bremen, who settled around the fortress erected by the German knights. After various vicissitudes, it was annexed to Prussia 1772, and after a period of decline, is again thriving. The larger vessels unload at Pilau, which serves as the harbor of Elbing. Pop. (1880) 35,842; (1900) 52,510.

**ELBOW**, n. *ël'bō* [AS, *elmboga*; Dut. *elleboog*; Icel.



## EL CANEY—ELCHE.

*alnbogi*, the bow or bending of the arm: Gr. *ōlēnē*; L. *ulna*, the forearm; and AS. *boga*, a bending]: the joint or outer curve in the middle of the arm when bent (see ARM); a sudden turn or bend in a river or road; the obtuse angle of a wall or building: V. to push or drive, as with the elbow; to encroach on. EL'BOWING, imp.: ADJ. pushing; jostling. EL'BOWED, pp. -*bōd*. ELBOW-CHAIR, arm-chair. ELBOW-JOINT, n. in *anat.*, a hinge-joint at the spot where the lower extremity of the humerus is in contact with the radius and ulna. ELBOW-PIECES, in *armor*, known as *coudieres*, metal plates used to cover the junction of the rere-brace and vant-brace by which the upper and lower half of the arm were covered. They were sometimes of inordinate size. An *elbow-gauntlet*, was a gauntlet of plate reaching the elbow, adopted from the Asiatics in the 16th c. ELBOW-ROOM, ample room for motion. ELBOW-TONGS, n. crucible tongs with jaws bent between the joint and chops. AT THE ELBOW, at hand; near. JOG THE ELBOW, to waken up; to remind a person of a thing. OUT AT ELBOWS, the sleeve of a coat so torn or old as to show the shirt beneath; having shabby clothes; reduced in circumstances. ELBOW-GREASE, *familiarly*, continuous hard labor in rubbing; the perspiration excited by hard physical work.

EL CANEY, a fortified town of Cuba; 4 m. n.e. of Santiago. During the war with Spain it was the scene of a great American victory. Captain Capron, who led the advance of General Lawton's command, fired the first shot of the fight at 6 A. M. on 1898, July 1, and the battle continued from sunrise to sunset, with only an occasional short intermission. A shot from Capron's battery of four guns tore away the Spanish flag on the fortification. The American guns were not heavy enough to destroy the enemy's works, and at 8 o'clock General Lawton's infantry assaulted and captured the hill with many prisoners. In 1901 the United States government purchased the battlefield and approaches for a national reservation.

ELCESAITES, *ēl-sē'sā-īts* or ELCESSEANS, *ēl-sē'sē-anz* [named after *Elxai*, a Jew, their founder]: in *chh. hist.*, sect founded by Elxai, in the 2d c., during the reign of Trajan. Elxai commingled Oriental philosophy with Judaism. He speaks respectfully of the Messiah, but whether he referred to Jesus of Nazareth is not quite plain, and Epiphanius doubts whether the Elcesaites should be regarded as a Christian or as a Jewish sect.

ELCHÉ, *āl'chā* (anciently, *Illice*, or *Illice*): town of Spain, province of Alicante, 16 m. s.w. of the town of Alicante, picturesquely built on both sides of a steep ravine, near the Elda, a tributary of the Segura, and about two leagues from the sea. It has an Oriental appearance. The climate is like that of eastern lands, winter is unknown, and around the town rises a huge encircling plantation of palms; the Arab alone is lacking to complete the likeness to an Oriental city. E. is flourishing and well built, its streets in general are wide and clean, and it has numerous

## ELCHINGEN—ELD.

squares and public walks. The church of Santa Maria is an imposing edifice, with a large dome, five gates, a famous organ, and a tabernacle made of precious marbles. The dates gathered from the palm-plantation around E. are exported from Alicante; they are not so good as Barbary dates, though sold as such. Its manufactures are linens, woollens, cottons, brandy, wine, cigars, oil, soap, etc.; in these articles, and in cattle, rice, and wool, there is considerable trade. Pop. about 18,500.

ELCHINGEN, *ěl'chĩng-én*: village of Bavaria, on the left bank of the Danube, about eight m. n.e. of Ulm: noteworthy as the scene of a battle, 1805, Oct. 13, between the French under Ney and the Austrians under Laudon, in which the latter were defeated. Ney's victory obtained for him the title of Duke of Elchingen.

ELCHO, *ěl'kō*, FRANCIS WEMYSS CHARTERIS DOUGLAS, Lord: b. 1818, Aug. 4. succeeded his father as Earl of Wemyss 1883. Educated at Christ-church, Oxford, where he graduated 1841, he was returned to the house of commons as M.P. for East Gloucestershire 1841, July, to 1846, Feb., and sat for Haddingtonshire 1847-82. He accepted office in the coalition govt. of the Earl of Aberdeen, and was a lord of the treasury 1853, Jan., to 1855, Feb. In the organization of the Rifle Volunteers in Great Britain 1859, the centre of the volunteer military organization, Lord E. took the earliest and most prominent part. He is LL.D. of Edinburgh University. In 1871 he published *Letters on Military Organization*.

ELD, n. *ěld* [AS. *yldo*, antiquity, old age: *cald*, old: Icel. *aldr*, old age: Goth. *alds*, an age]: in *OE.*, old; old age; antiquity: V. to make old. EL'DING, imp. EL'DED, pp.



## ELDER.

**ELDER**, a. *ēl'der* [AS. *eald*, old; *yldra*, elder: Icel. *ellri*, elder (see **OLD**)]: senior; opposed to *younger*; older, compar. degree of *old*: N. one advanced in life; a member of the lowest ecclesiastical court in the Presbyterian Church—also called a **RULING ELDER**. **EL'DEST**, a. *-dēst* [AS. *yldesta*]: superl. degree of *old*; most advanced in age, usually applied to persons. **EL'DERSHIP**, n. office of an elder. **EL'DERLY**, a. *-lī*, somewhat old. **ELDER-BRETHREN**, n. the masters of the Trinity House, in London. **ELDER-SON**, n. among the Albigenses and other Cathari, the higher of two vicars attached to the bishop.

**ELDER**, n. *ēl'der* [AS. *ellarn*; Icel. *elri* or *alri*, elder-tree: Ger. *holder*, the elder-tree—from Ger. *hohl*, hollow; *der* or *tar*, signifying tree, so called from its hollow wood]: a common tree producing white flowers and dark-purple berries; the *Sambucus nigrā*, ord. *Caprifoliaceæ*. *Note*.—Skeat says that *d* is excrescent, and that the true spelling is *eller*.

**EL'DER** (*Sambucus*): genus of plants of the nat. ord. *Caprifoliaceæ*, chiefly of shrubs and trees, with pinnate leaves, small flowers of which the corolla is wheel-shaped and 5-cleft, and 3-seeded berries. The wood of the young



Flower-stock, Leaves, and cluster of Berries of *Sambucus Nigra*.

shoots has large pith. The **COMMON E.** (*S. canadensis*) has white pith and black berries. The **RED-BERRIED E.** (*S. pubens*) has brown pith; berries rarely white; bark warty. —*S. nigra* (Scotch, Bourtrees) of Europe and Asia is a very large shrub, sometimes a small tree, with rather large leaves, and large terminal cymes of cream-colored flowers, which are followed by small black—or rarely whitish—berries. Its leaves and young shoots diffuse

## ELDER.

a narcotic odor, and it is said to be dangerous to sleep under its shade. The inner bark has a bitter acrid taste. The leaves possess the same properties in a rather milder degree. The flowers have a peculiar sweetish and rather sickening smell, but are much used for making a distilled water—*Elder Flower Water*—which has a very agreeable odor, and is employed both in perfumery and in confectionary. Distilled with water alone, they yield a volatile oil, which, on cooling, assumes a buttery consistence. A popular cooling ointment is made by boiling them in lard. They are used also for imparting a flavor to currant-wine and jelly, being added at the time of a slight fermentation which takes place in the spring of the year, after the currant-wine is made; and a wine is made from them which in scent and flavor resembles Frontignac. The clustered flower-buds are pickled, and used like capers. A grateful wine, well known in England, especially about Christmas, and in America, is made from the berries; and in parts of Kent there are large plantations of E. to supply the London market. It is generally drunk hot or *mulled*. The berries are subacid and sweetish, with a rather unpleasant flavor. A rob made from them is a gentle aperient, diuretic, and sudorific, easily administered to children. In some parts of Germany, the poorer people use them as an ingredient in soups. They are said to be largely used in England in the adulteration of port wine, and the manufacture of spurious port wine.—The wood of the E. is yellow; that of old trees is very hard and tough, takes a fine polish, is used by turners, and as a substitute for box-wood in making mathematical instruments and other articles. Tops of fishing-rods are sometimes made of it. The pith of the young shoots being very light, is generally used to make pith-balls for electrical experiments. Toys for children also are made of it; and few boys are unacquainted with the use of E. branches, from which the pith has been expelled, for making pop guns. The E. is useful as a screen-fence near the sea and in other exposed situations, as it grows with remarkable vigor, and makes great shoots, the destruction of the more tender and less mature parts of which in winter only tends to make it more bushy and useful for shelter. It is readily propagated by portions of its shoots stuck into the ground.—The SCARLET-FRUITED E. (*S. racemosa*), native of s. Europe and of Siberia, much resembles the common E., but has softer and more herbaceous shoots, remarkably large buds, which are conspicuous in winter, and racemes of greenish-white flowers, which are followed by scarlet berries, the racemes of ripe fruit having much the appearance of beautiful pieces of coral. It is a frequent ornament of shrubberies, and when in full fruit, is almost unrivalled in beauty, but more frequently produces its fruit in cold districts than in those where the milder winter induces it to flower before the spring-frosts are over. The juice of its berries is a powerful sudorific.—The DWARF E. or DANEWORT (*S. Ebulus*), is a coarse herbaceous plant, with fetid smell. The *inner bark* has been employed in dropsical complaints as a hydragogue cathartic, given in the



## ELDER.

form of a decoction prepared by boiling down 1 oz. of the bark in 2 pints of water till the whole is concentrated to 1 pint. The dose is about 4 fluid ounces. In smaller quantities, it is useful as an aperient in certain chronic disorders. The *flowers* are white when freshly plucked, but become yellow in drying, and consist of a volatile oil, certain gummy, resinous, albuminous, and saline matters, and are stimulant and sudorific. They are employed in the preparation of *elder flower water* by adding 2 gallons of water and 3 ounces of rectified spirit to 10 lbs. of the flowers, and distilling off about 1 gallon. It is a good perfume. *White elder ointment* is procured by boiling equal weights of lard and elder flowers, and pressing through a cloth. It has an agreeable odor, and is employed as a cooling application to surfaces which are irritable. When the berries are expressed, they yield a purple juice named *elder rob*, which, when diluted with water, is useful in inflammatory and febrile complaints as a cooling drink. It contains malic and citric acids, sugar, gum, etc.,

EL'DER: office-bearer in Presb. churches, ranking next below pastor or bishop. The name is an exact translation of the Greek *presbyteros*, which occurs frequently in the New Testament, and from which the English word *priest* is derived. That the *presbyteroi* of the churches of the apostolic age were not *priests* in the special sense of that word, in which it denotes a person appointed to offer sacrifice on behalf of others, and to appear for them before God, is admitted by Protestants in general; but there remains much division of opinion as to the precise meaning of the term, and the bearing of the passages in which it occurs on the subject of church government. See BISHOP: CONGREGATIONALISM: PRESBYTERIANISM. All are agreed, indeed, that *bishops* and all pastors of congregations are included among *elders* in the scriptural use of the term; but the use of it is now limited in Presbyterian churches to designate the office-bearers associated with the minister of each congregation in the care and oversight of the flock. The New Testament use, however, remains in some Bapt. churches, which speak of their pastors as *elders*; and in the Meth. Episc. Church, presiding elders, are appointed to have an oversight of the churches in a district. Elders exist in the various Presbyterially organized churches of the Reformation; and even in the Church of England, Bp. Burnet states that their introduction was prevented only by Queen Elizabeth's dislike to a proposal, in which, with Burleigh and others of her advisers, she saw danger of an abatement of her prerogative, 'since, if the concerns of religion came into popular hands, there would be a power set up distinct from hers, over which she could have no authority.' In her view a body of elders in a local church probably seemed a dangerous approach to Congregationalism, from which, however, its principle is evidently widely diverse. In some Prot. churches, elders are now appointed only for a certain term of office; but formerly it was, and generally it is, until death, resignation. removal from the bounds of

## ELDER.

the congregation, or deposition. The appointment of elders takes place variously: in the Established Church of Scotland, they have generally been nominated by the kirk-session (consisting of the minister and elders); in the other Presb. churches of Britain and America, they are elected by the congregation. In most of the churches of the continent of Europe, which have any kind of connection with the state, there is some regulation of the civil law or some interference of the civil authorities in this matter. The ordination of elders takes place in the congregation, but usually without imposition of hands; a difference between the mode of ordination of elders and ministers for which it is not easy to account, and which has certainly tended to produce a general impression that a greater difference of office subsists than the advocates of Presbyterianism admit. In the Established Church of Scotland, the elders have generally discharged the functions of deacons (q.v.), at least as much as those which, according to the theory of Presbyterianism, belong to their own office; an example which, until recently, was almost universally followed in other Presbyterian churches, but is now often departed from. According to the *Second Book of Discipline* of the Church of Scotland, it is the duty of elders to watch over the spiritual welfare of the people, to admonish, to visit the sick, to assist in the examination of persons seeking admission to the Lord's Table, etc. Elders, with ministers, compose all the courts or assemblies of the Presbyterian churches, and have equal votes in all questions.

ELDER, *él'dér*, WILLIAM HENRY, D.D.: Rom. Cath. abp. of Cincinnati; b. Baltimore, 1819. He graduated at Mount St. Mary's College, Emmettsburg, Md., and the College of the Propaganda, Rome; was ordained 1846; became pres. and prof. of theol. in Mount St. Mary's; and was chosen bp. of Natchez 1857. During the civil war and the yellow fever epidemics of 1878-9, he showed great heroism in caring for the sick. He declined appointment as coadjutor abp. of San Francisco 1879, was made coadjutor to Abp. Purcell of Cincinnati 1880, and became abp., presided over the 4th provincial council of Cincinnati 1882, and was conspicuous in the 3d plenary council of Baltimore 1884. He organized in the United States the temperance society known as the Red Cross League, founded in England by Cardinal Manning.



## ELDON.

ELDON, *ël'don*, Baron, Lord High Chancellor of England (JOHN SCOTT): 1751, June 4—1838, Jan. 3; b. Love Lane, Newcastle, of obscure but respectable parents. He entered University College, Oxford, 1766, with a view to the priesthood, and obtained a fellowship 1767. His runaway marriage with Bessy Surtees (1772) greatly clouded his prospects for a time, though he had with her a long and happy wedded life. He turned to the study of law 1776, soon gained success; and received knighthood and the office of solicitor-general 1788. He became atty.gen. 1793, chief justice of the common pleas 1799, in which year, after 17 years in the house of commons, he entered the house of lords as Baron Eldon. He became Lord High Chancellor 1801—occupying the woolsack under successive govts., with little intermission, till 1827. In 1821 George IV. made him an earl; and his bro. William was raised to the peerage as Lord Stowell (q.v.). He died leaving an estate over half a million sterling.

E. is said to have been a man of very winning and courtly manners, and of a handsome, prepossessing appearance. In the circle of his friends he is said to have been irresistible, and probably to the charms of his manner his success in life was somewhat owing. His career amply proves that he was a man of the greatest talent, sagacity, and power, in managing men. He was undoubtedly a great lawyer, and his judgments, which have been much praised for their accuracy, fill a small library; at the same time, he took so long to arrive at them, that he has been charged with having caused more injustice by delay than less able judges by the unjustness of their decisions. For literature, as for art, he had no feeling, and the style of his decisions is generally detestable. He was a great drinker, though drink seems never to have unfitted him for work; and is said, when he went into retirement, to have spent his time over the newspapers and the gossip of old cronies, preferring their company to that of men of refinement and taste. Undoubtedly, the best of him is seen in his private relations. His love of and devotion to 'Bessy' his wife was truly beautiful. As a public man, he is far from estimable. He was no statesman; his name is not associated with even a single law intended purely for the public good. For 40 years he was a leading enemy of reform and religious liberty. The champion of the church, he never attended public worship. Without political principles, his whole stock in trade, as a politician, was zeal against the Rom. Catholics, which, however, was adequate in the state of public feeling at the time. He is said to have added parsimony to his other defects; this may have arisen from habits formed during his early struggles; but he certainly showed himself capable of generosity.—See his *Life*, by Twiss (1846); and Campbell's *Lives of the Lord Chancellors*.

## EL DORADO—ELEATIC SCHOOL.

**EL DORADO**, n. *ěl dō-rá'dō* [Sp. the golden region—from *el*, the; *dorádo*, gilt]: a country fabled to be very rich in the precious metals; a territory possessed of, or supposed to possess, great stores of silver and gold. It existed originally in the imaginations of the Spanish conquerors of America, whose insatiable avarice loved to dream of richer rewards than those of Mexico and Peru. The Castilians found an imitator in Sir Walter Raleigh, who twice visited Guiana in quest of this fabulous region. The name has at last made for itself an abiding-place beyond the furthest limits of Spanish possession. It indicates a county in the n.e. of California, of which the capital, Placerville, stands near the spot where the first discovery of gold was made in that state. The district in question is drained by some of the n. feeders of the Sacramento, which empties itself into the Bay of San Francisco.

**EL DORADO**: city and cap. of Butler co., Kan., on the Walnut river 32 m. n.e. of Wichita, on the Atchison Topeka and Santa Fé and Missouri Pacific r.rs. It is surrounded by a fine farming country making a specialty of stock-raising. It has carriage factory and flour mills, woolen mill, iron foundry, and stone quarries. It is supplied with water-works, elec. light, and gas. It has one nat. bank (cap. \$50,000). Pop. (1890) 3,339; (1900) 3,466.

**ELDRITCH**, a. *ěl'dritch* [Scot.: comp. Gael. *oillteil*, dreadful; *oillt-chritheach*, trembling from terror]: in *OE.* and *Scot.*, ghostly; unearthly; horrible.

**ELEANOR**, *ěl'a-nor*, OF AQUITAINE, Queen of France and afterward of England: 1122-1203; daughter and heir-ess of William IX., Duke of Guienne or Aquitaine. She was married to Prince Louis when 15 years old, and became queen of France by his succession to the throne as Louis VII. the same year. His extreme ascetic habits and her love of pleasure, poetry, and art, unfitted them for each other and led to an estrangement which was so intensified during his second crusade to the Holy Land, on which she accompanied him, 1147, that on their return to France they were divorced 1152, Mar. 18. The same year she married Henry Plantagenet, who became king of England as Henry II. 1155. This marriage, resulting in the annexation of the duchy of Guienne to England, was displeasing to King Louis, and precipitated war between France and England. E. became angered at the neglect of Henry, caused her sons Geoffrey and Richard to rebel against him, and for this was arrested 1173 and imprisoned till after Henry's death 1189, when his successor, Richard I., released her. She was regent of the kingdom during his absence in the Holy Land 1190-94, went to Germany with his ransom from captivity, arranged his marriage with the daughter of the king of Navarre, and after his return retired to the abbey of Fontevrault, where she died.

**ELEATIC SCHOOL**, *ě-lě-ăt'ík*: group of ancient Greek philosophers. It begins with Xenophanes of Colophon, who settled in Elea, a Greek city of lower Italy (whence the name), and includes Parmenides and Zeno, who both belonged to Elea, also Melissus of Samos. The most flourishing period of this philosophy was B.C. 540-460. In op.



## ELECAMPANE.

position to the physical philosophy of the Ionic school, and to the doctrine of Heraclitus (q.v.), who denied all being or existence, the Eleatic philosophers made this conception of pure being, unmixed with all marks or properties derived through the senses, the foundation of all their speculations. As *being*, one and unchangeable, seemed to them to exclude all plurality and alteration of appearances, they gave up, with remarkable consistency, all attempts to explain scientifically the world as we see it; and the startling abruptness of their simple fundamental principle, taken in conjunction with the opposite doctrine of Heraclitus, was one of the chief causes that led Plato at a later period to attempt a reconciliation between the notions of *being* and *becoming*, or of absolute existence and phenomena.—See XENOPHANES.

ELECAMPANE, n. *él'ě-kām-pān'* [Fr. *énule-campane*; Sp. and It. *enula-campana*; L. *inŭlă helēniŭm*—from Gr. *heleniŏn*, a certain plant said to have sprung from Helen's tears], (*Inula*): genus of plants of the nat. ord. *Compositæ*,



Elecampane (*Inula Helenium*).

sub-order *Corymbiferae*, nearly allied to *Aster*. The only important species is the common E. (*I. Helenium*), native of damp meadows in the middle and south of Europe. This plant, formerly much cultivated for its root used in medicine, still retains its place in the pharmacopœias, though comparatively neglected. The root has a faint aromatic odor; and a bitter, acrid, and somewhat camphor-like taste. It acts as a gentle stimulant to the organs of secretion, promotes expectoration, and is diuretic and sudorific. It contains a peculiar principle called *Inulin*, which resembles starch, but is deposited unchanged from

## ELECT—ELECTION.

its solution in boiling water on its cooling, and gives a yellowish instead of a blue color with iodine; also another peculiar principle called *Helenin*, or *Elecampane Camphor*, which resembles camphor in some of its properties.

**ELECT**, v. *ě-lěht'* [L. *electus*, chosen or picked out—from *ex*, out of; *lectus*, chosen]: to choose or select for an office by voting; to pick out or select for a use or purpose; to select from two or more that which is preferred—as, I *elect* to go to this or that place; to choose as an object of mercy or favor; in *law*, choice between two incompatible claims; it is applicable frequently in equity practice. Election, political: see **SUFFRAGE**: **ADJ.** chosen; chosen but not invested with office: **N.** those selected; those chosen or selected to eternal life. **ELEC'TING**, imp. **ELEC'TED**, pp. **ELEC'TION**, n. *-shŭn* [F.—L.]: the choice or selection of a person or persons to fill some office; public choice, as of an M.P.; power of choosing; liberty to choose or act—as, he went by his own *election*; divine choice; predestination. **ELEC'TIONEER'**, v. *-ēr*, to make interest for a candidate, especially as M.P., that is, member of parliament. **ELEC'TIONEERING**, n. the acts or practices used at elections in order to secure the return of a particular individual, usually applied to the office of M.P. **ELEC'TIONEER'ER**, n. one who. **ELEC'TIVE**, a *-tĭv*, depending on choice; regulated by choice; exerting the power of choice. **ELEC'TIVELY**, ad. *-lĭ*. **ELEC'TOR**, n. *-tēr*, one who chooses or elects; one having the right to vote; title formerly belonging to the German princes who elected the emperor. **ELEC'TORAL**, a. *-tēr-ăl* [F.—L.]: pertaining to elections or electors. **ELEC'TORATE**, n. *-tēr-ăt* [F. *électorat*]: the dignity or territory of an elector of the German empire; the body of electors or votes. **ELEC'TORSHIP**, n. rank or condition of an elector. **ELEC'TORAL FRANCHISE**, the right to elect members of parliament; the right to vote in the election of an M.P. **ELECTION COMMITTEE**, in Britain: see **PARLIAMENT**.—**ELECTION LAWS**: see **PARLIAMENT**.—**ELECTION OF SCOTTISH PEERS**: see **PARLIAMENT**: **PEERS**.—**SYN.** of 'elect, v.': to choose; select; appoint; prefer.

**ELEC'TION**, in Theology: the divine act by which certain individuals are chosen to salvation in Christ. The doctrine of election is the doctrine of 'God's everlasting purpose, whereby he hath constantly decreed by his secret counsel to deliver from curse and damnation those whom he has chosen in Christ out of mankind, and to bring them by Christ to everlasting salvation as vessels made to honor.' These words, substantially from the articles of religion of the Church of England, may be said to represent, in a moderate expression, the orthodox doctrine on the subject of election. Besides this form of the doctrine, there is a lower and a higher form of it, which, apart from technical and polemical language, may be said to spring—the one from the supposed subordination of the divine act or purpose to the divine foreknowledge of human conduct—the other from the exaltation of the divine act or purpose into an absolute and arbitrary supremacy, having no relation



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whatever to human will or conduct. The former of these extremes corresponds to the Pelagian or Arminian doctrine of E., the latter to the hyper-Augustinian or Calvinistic. The Arminian aims to condition or limit the absolute character of the divine act in redemption in some way or another; the Calvinist aims to give to this act, at least as far as traceable by man, the most arbitrary and irresponsible character. The one, while not altogether repudiating a doctrine of E., yet gives such prominence to the human conditions of the elective purpose, as (in the view of Calvinists) to destroy it altogether; the other maintains not only a doctrine of E. or predestination to salvation, but also the correlative doctrine of reprobation to perdition. In the view of the Arminian, salvation is within the choice of the human will; in the view of the thorough Calvinist, the human will is of little or no account as a cause—the decree of God is everything—and this decree (which Calvin admitted to be a '*decretum horribile*') absolutely determines some to everlasting life and some to everlasting death.—The Calvinistic view is that the separation has its source in the will of God, and not in the moral conditions of mankind; though this view may sometimes be traced also in the phraseology of some who deem themselves Arminian.

It is obvious, in the mere statement of such views, how audaciously theology has sought to settle questions beyond all human scrutiny and decision. In the nature of things, the ultimate nature of the relations between the divine and human will appear indeterminable; and, notwithstanding all the labor of inquiry devoted to such subjects in the history of opinion, it cannot be said that any advance of thought has been made regarding them. The tide of battle sets now forward, now backward, but over the same field. If the mere logic of the question be kept in view, the Calvinistic opinion has indisputable advantage over the Arminian—setting out, as it does, from the recognition of the divine will as absolutely supreme, and the source, consequently, of all subordinate action—a thought which is in the highest degree logically consistent. But then the moral perplexities which arise out of the practical application of this view, and the ease with which it may be perverted into a fanatical and dangerous error, will always repel many minds from its adoption. In any event, while divine truth may and should be explored by human logic, it is not to be held bound therein.

Although the expressions election, elect, etc., are frequent in Scripture, it cannot be said that what is known as the theological doctrine of E. was acknowledged by the Christian Church till the time of Augustine. The Greek Fathers confined their attention almost entirely to questions purely *theological*—that is to say, relating to the character and constitution of the Godhead. Gnosticism and Arianism, the two main forms of heretical opinion before Augustine, indicate the channels into which theological discussion had previously run. It was not till the Latin mind had taken up this discussion, that the more practical question of the relation of the divine and human will in

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redemption came to receive special attention. The controversy between Pelagius and Augustine in the beginning of the 5th c., brought out almost all the aspects of the question which have since, at successive epochs in the history of the church, risen into renewed prominence. The contests between the Scotists and Thomists in the 14th c. between the Arminians and Calvinists, and, within the Roman Church, between the Jansenists and Molinists in the 17th c., are recurring expressions of the same radical conflict or divergency of opinion, which, as Coleridge suggested, may originate in a constitutional diversity between two classes of minds. The spirit of modern theology is adverse to the logical disputations engendered by such discussions, and finds its more appropriate and useful field of labor in the province of critical, historical, and ethical inquiry.

**ELECTIVE SYSTEM, IN COLLEGES AND UNIVERSITIES:** that course of study by which the former curriculum of Greek, Latin, mathematical, and philosophical studies is supplanted, wholly or in part, by more varied subjects, mainly scientific and historical. Its conception was due to various causes, principally to the recent development of science, to the desire to make a collegiate education prepare more directly for a subsequent career, and to the view that congenial studies give better results. The system had its origin in Harvard Univ. under Pres. Chas. W. Eliot, and has been adopted to a greater or less extent by the other leading institutions of the country. The extreme of the system has been reached by the substitution at Harvard and elsewhere of French and German for Greek in the requirements for matriculation for the degree of bachelor of arts, thus causing a modification and giving freedom of choice in the preparatory training. In more conservative foundations the substitution of modern languages for Greek is allowed only in the course leading to the degree of bachelor of science.—Thus from the beginning of his course the matriculate selects, under advice, such studies as from term to term may make up the requisite number of hours per week, generally limited to fifteen. Certain required studies, as elocution, an elementary knowledge of physics, and English still attend the extreme development of the system. In the greater number of institutions, and still to some degree in the most liberal, the Freshman year conforms to a required course, while electives, as some modern language substituted for mathematics, begin in the Sophomore year and become general in the Junior and Senior, retaining, however, a fixed amount of science, history, and philosophy. The elective system has been the object of persistent attacks by those who claim that too great liberty of action is granted to students mentally untrained, who consequently choose those studies most congenial to them, and who vary frequently their course, thus resulting in a superficial knowledge; and by others who take a broader view in maintaining that the study of classical antiquity, in great measure discarded, is necessary to literary and intellectual culture. Its advocates, on the



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other hand, assert that since the adoption of the essential features of the elective system the requirements for matriculation have increased in quantity and variety; that the student's self-reliance and judgment are developed; that a constant pressure is exerted by the collegiate authorities to encourage a logically connected series of studies, by means of honors and scholarships, and that as a matter of fact more and better work is done. A successful compromise, which inclines, however, to the liberal side, has been effected in the Johns Hopkins Univ.—and on a similar principle in some other institutions—in which French and German are a substitute for Greek in the requirements for matriculation, but where the student must select, from the outset, his entire course from among seven pre-arranged groups, designated by their leading subjects, and in addition must take a prescribed amount of elocution, drawing, English, and historical and philosophical studies.

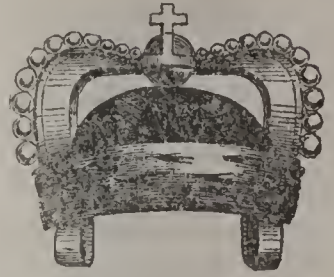
ELECT'OR, in the German Empire: one of those great princes who had the right of electing the emperor or king. In the earliest times, under the Carlovingsians, the crown was hereditary; afterward, Germany became formally an elective monarchy, but the election was practically almost limited to the reigning family. Under Emperor Charles IV., the right of election became limited to the holders of the highest ecclesiastical and civil offices, some of which gradually became hereditary, and connected with territorial principalities, as in the case of the Hohenstaufens and of the Dukes of Bavaria, Saxony, Swabia, etc. Thus there arose seven electors, those of Mayence, Treves, and Cologne (as being the chief primates and chancellors of the empire), the electors of the Palatinate and of Bavaria long exercising the right by turns, and the electors of Brandenburg, Saxony, and Bohemia. From 1400 to 1708, the right was never exercised on the part of Bohemia, but otherwise no change took place from the middle of the 14th c. to the peace of Westphalia. By the peace of Westphalia, an eighth electorate was established, Bavaria and the Palatinate being each allowed the full right; and in 1692, a ninth was added, that of Brunswick-Lüneburg, but not without resistance by the electors and states of the empire, so that the new electorate was not fully recognized till 1710. In 1777, the number was again reduced to eight, the Elector Palatine inheriting Bavaria. The electors held a high and very peculiar position in the German empire. The Golden Bull describes them as 'the seven pillars and lamps of the holy empire.' They had certain important rights and privileges. They were leagued from the year 1338 for the maintenance of their freedom of election against the pope. They had royal dignities, lacking only the title of majesty. The territories belonging to their electorates were indivisible.

The peace of Luneville, 1801, made a great change in the German empire, and subsequent changes took place during the times of French ascendancy, which issued in the dissolution of the ancient German empire. The title of Elector, used by the Prince of Hesse-Cassel, an elec-

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torate which was added with other new electorates in 1802, was the last relic of the old dignities, and was merely nominal even before 1866. See GERMANY.

ELECTORAL CROWN, or, more properly, CAP, was a scarlet cap, turned up with ermine, which was worn by the electors of the Empire. It was closed with a demi-circle of gold, covered with pearls, and on the top was a globe with a cross on it, also of gold.



Electoral Crown.

ELECTORAL COLLEGE, PRESIDENTIAL: name applied to the electors of a state when assembled to vote for a pres. and vice-pres. of the United States. Though the federal constitution designates the number and defines the duties of electors, the term E. C. was not used till 1821, and did not appear in law till the act of 1845, Jan. 23, which provided for filling vacancies in each 'college of electors.' The question of a mode of electing the pres. came up in the early sessions of the convention that framed the constitution, and created a great diversity of opinions. Both the Va. and the N. J. plans placed the choice of the pres. in congress; Penn. desired a popular election by districts; Conn. favored congressional selection; Mass. first wanted electors chosen by the states in proportion to population, but afterward expressed a preference for a selection by the governors of the states; Hamilton proposed a choice by secondary electors, chosen by primary electors, chosen by the people; and Gouverneur Morris advocated a general popular vote. The Va. plan was agreed to in the committee, and after the popular election and choice by electors had been voted down, was unanimously approved by the convention. It was afterward reconsidered, and the choice by electors chosen by state legislatures substituted; this in turn was reconsidered and lost, and the choice by congress revived. Within the last two weeks of the convention, the committee of detail reported the plan very nearly as it was finally adopted. During all this discussion scarcely a word had been said about the vice-pres., and the only formal mention of that officer occurred in the committee's plan.

In Art. II., sec. 1, of the constitution it was provided that each state should *appoint* a number of electors equal to the whole number of senators and representatives to which the state might be entitled in the congress, in such manner as the legislature might direct; and that the congress might determine the time of *choosing* the electors, and the day on which they should give their votes, which day should be the same throughout the United States. Under this authority, the second congress fixed the day when the electors should meet and vote on the first Wednesday in Dec., and the day of their election 'within thirty-four days' preceding it. The first mode of election was modified by the XIIth amendment to the constitution, proposed 1803, ratified 1804, and still in force. It will be noticed that authority was originally given the legislature of



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each state of having its electors selected either by appointment or by choosing, i.e., by popular vote. Subsequent legislation has fixed the first Tuesday after the first Monday in Nov. as the day for choosing electors in all the states, and this date still remains as that on which, in a popular sense, the pres. and vice-pres. are elected, though in reality the election does not occur till the following Feb. In each presidential election the various political parties in the several states head their ballots with the names of their party's candidates for presidential electors, equal in number to the total of the state's senators and representatives in congress; and the individual voting is for these electoral candidates, and not for the presidential candidates. The electoral candidates of the party having a majority of the votes in a state, become the presidential electors of that state; and on the 2d Monday in Jan. following, these, assembled at the state cap., vote for the candidates for pres. and vice-pres. of their own political party, in the manner prescribed by Art. XII. of the Constitution (q.v.). The electoral vote of each state is transmitted direct to the pres. of the senate by a 'messenger of the electoral college' of each state, usually elected or appointed by the electors. He receives a mileage for his services; but the office of messenger is considered in itself a high distinction. The decisive election takes place before the U. S. senate and house of representatives, in joint session for the purpose, on the 2d Wednesday in Feb. following. If either candidate has a majority of the votes of the whole number of electors, he is declared by the pres. of the senate to be duly elected, the electoral votes for pres. being counted first, and, after decision, those for vice-pres. If no candidate for pres. has such majority, the duty is devolved on the house of representatives of immediately choosing a pres. by ballot from the three candidates having the highest number of electoral votes, and if the house fails to make such choice the vice-pres. shall act as pres. Again, if no candidate for vice-pres. has the required majority, the duty is devolved on the senate of choosing a vice-pres. by ballot from the two candidates having the highest number of electoral votes. The house of representatives is allowed till Mar. 4 to choose a pres., whenever the right devolves upon it. The first electoral votes were counted by the pres. of the senate 1789, April 6 (Monday); since then the day of the week has always been Wednesday, the month Feb., and the day of the month from the 8th to the 14th.

Under congressional apportionment, based on 12th census, pres. electors (1903-13) number 476, i.e., one for each 90 senators and 386 representatives, divided among the states as follows: Ala., 11; Ark., 9; Cal., 10; Col., 5; Conn., 7; Del., 3; Fla., 5; Ga., 13; Ida., 3; Ill., 27; Ind., 15; Io., 13; Kan., 10; Ky., 13; La., 9; Me., 6; Md., 8; Mass., 16; Mich., 14; Minn., 11; Miss., 10; Mo., 18; Mont., 3; Neb., 8; Nev., 3; N. H., 4; N. J., 12; N. Y., 39; N. C., 12; N. D., 4; O., 23; Or., 4; Pa., 34; R. I., 4; S. C., 9; S. D., 4; Tenn., 12; Tex., 18; Ut., 3; Vt., 4; Va., 12; Wash., 5; W. Va., 7; Wis., 13; Wyo., 3.

## ELECTORAL COMMISSION.

**ELECTORAL COMMISSION, PRESIDENTIAL:** tribunal created by act of congress 1877, Jan. 29, for the purpose of ascertaining the legal vote of Fla., La., Or., and S. C. in the pres. election of 1876. The returns of the popular vote showed a total of 4,284,855 for Samuel J. Tilden and Thomas A. Hendricks, democratic candidates, and 4,033,950 for Rutherford B. Hayes and William A. Wheeler, republican candidates, a democratic plurality of 250,935. In Fla., La., and S. C. both parties claimed a victory, and forwarded returns from their respective electors. The certificates under the official seal of the respective governors gave the election to Mr. Hayes by a majority of one electoral vote. The democrats alleged an unjust canvass of the votes, the rejection by the returning boards of legal democratic votes, and the election of their candidates by popular vote. At all previous elections the canvass of congress had been confined exclusively to the certificates issued by the governors. It was, therefore, manifest that a canvass by congress, conducted after the manner of all previous ones, would elect the republican candidates, or terminate in a disagreement between the two houses. At this time the senate had a republican majority, and the house of representatives a democratic one. A very heated controversy arose as to the constitutional mode of deciding between the competing certificates, and as to the power of congress as the final canvassing board to go beyond the returns for the purpose of disclosing fraud, intimidation, or illegal practices, that could be interposed as a bar against the acceptance of the returns certified by the governors. In this emergency, when even the peace of the country seemed threatened, a joint committee of the two houses was appointed early in 1877, Jan., to report some mode of ascertaining the legal result of the election that would be satisfactory to both parties. The committee of the senate consisted of George F. Edmunds (Vt.), Frederick T. Frelinghuysen (N. J.), Roscoe Conkling (N. Y.), and Oliver P. Morton (Ind.), republicans; and Allen G. Thurman (O.), Thomas F. Bayard (Del.), and Watt W. Ransom (N. C.), democrats; and of the house, Henry B. Payne (O.), Eppa Hunton (Va.), Abram S. Hewitt (N. Y.), William M. Springer (Ill.), democrats; and George W. McCrary (Ia.), George F. Hoar (Mass.), and George Willard (Mich.), republicans. On Jan. 18 this committee, with the exception of Senator Morton, reported unanimously a bill providing for the creation of a special tribunal, to be composed of 5 senators, 5 representatives, and 5 associate justices of the U. S. supreme court, to which the conflicting certificates and documents accompanying them should be referred, as well as all questions relating to the powers of congress in the premises; and further providing that the decisions of the tribunal should be final in every case, unless rejected by the concurrent vote of both houses. This bill passed the senate Jan. 25, the house Jan. 26, and was approved by the pres. Jan. 29. On Jan. 31 the E. C. was selected. By agreement between the two houses, 3 republicans,



## ELECTRA—ELECTRIC.

George F. Edmunds, Frederick T. Frelinghuysen, and Oliver P. Morton; and 2 democrats, Allen G. Thurman and Thomas F. Bayard, were chosen in the senate; and 3 democrats, Josiah G. Abbott, Henry B. Payne, and Eppa Hunton; and 2 republicans, James A. Garfield and George F. Hoar, in the house. The associate justices designated in the bill by their districts were Nathan Clifford (Me.), Samuel F. Miller (Io.), Stephen J. Field (Cal.), and William Strong (Penn.), and they selected as the fifth justice Joseph P. Bradley (N. J.). The political complexion of the whole commission was 8 republicans, 7 democrats. An organization was perfected Feb. 1, and the commission began examining the disputed returns from Fla. On Feb. 26 Commissioner Thurman was taken sick, and Francis Kernan (N. Y.) was chosen in his stead. During the sitting of the E. C. the delayed returns from Or. were received, objected to, and referred to it. The bar, beside the ablest lawyers of both parties in both houses, who appeared as objectors to various returns, was composed of Messrs. O'Connor (N. Y.), Black (Penn.), Trumbull (Ill.), Merrick (D. C.), Green (N. J.), Carpenter (Wis.), Hoadley (O.), and Whitney (N. Y.), on the democratic side; and Messrs. Evarts and Stoughton (N. Y.), and Matthews and Shellabarger (O.), on the republican. The decision of the E. C. on the last returns (Or.) was communicated to both houses of congress in joint session on Mar. 1, and that body then proceeded with the count. At 4 o'clock A.M., Mar. 2, Thomas W. Ferry (Mich.), pres. *pro tem.* of the senate, and pres. of the joint convention, announced that Messrs. Hayes and Wheeler had received 185 electoral votes, and had been duly elected pres. and vice-pres. respectively.

**ELECTRA**, n. *ē-lĕk'tra* [Gr.]: in *Gr. myth.*, the daughter of Agamemnon, King of Argos, sister of Orestes, and wife of Pylades; sometimes called Laodice. Her adventures and misfortunes formed the subject of dramas by Æschylus, Sophocles, Euripides, and Racine. That of Sophocles is considered the most perfect, and in it E. induces her brother, whose life she has saved from her father's murderers, to avenge the death of that parent, which he does with the aid of Apollo. The *Gr. myth.* mentions five other persons of this name. In *astron.*, E. is one of the Pleiades; also an asteroid, the 130th found. It was discovered by Peters, 1873, Feb. 17; in *zool.*, a genus of membranaceous polyps; in *bot.*, genus of composite plants. The two known species are from Mexico

**ELECTREPETER**, n. *ē-lĕk-trĕp'ĕt-ĕr* [Gr. *ēlektron*, amber; *trepō*, I turn]: instrument for changing the direction of electric currents. [Term incorrectly formed.]

**ELECTRIC**, a. *ē-lĕk'trik*, or **ELEC'TRICAL**, a. *-kāl* [Gr. *ēlektron*; L. *electrum*, amber; F. *électrique*, electric] pertaining to electricity; capable of exhibiting electricity when excited by friction; containing electricity; communicating a shock as produced by electricity: N. any substance capable of exhibiting electricity; an insulator, as amber, glass, etc. **ELEC'TRICALLY**, ad. *-lĭ*. **ELECTRICIAN**, n. *ē-lĕk-trish'ān*,

## ELECTRIC.

one skilled in electricity. E'LECTRIC'ITY, n. -trīs'ī-tī, the science which treats of the laws of attraction and repulsion exhibited by bodies under certain circumstances; a highly subtle and mysterious power, often called the electric fluid, which apparently pervades all bodies; *more strictly*, one of the forms of energy exhibited in lightning, the electric spark, electric current, etc.: see ELECTRICITY, THEORY OF; ATMOSPHERIC ELECTRICITY, ETC. ELEC'TRIFY, v. -trī-fī [L. *fūcō*, I make]: to charge or affect with electricity; to excite suddenly and violently. ELEC'TRIFYING, imp. ELEC'TRIFIED, pp. -fīd, charged with electricity; excited suddenly, as with a shock of electricity, generally by something of a pleasing and inspiriting nature. ELEC'TRIFI-ABLE, a. -fī'ā-bl, that may be electrified. ELEC'TRIFICA-TION, n. -trī-fī-kā'shūn. ELEC'TRINE, a. -trīn, relating to amber. ELEC'TRIZE, v. -trīz, to invest with electric force, to endue with electricity. ELEC'TRIZING, imp. ELEC'TRIZED, pp. -trīzd. ELEC'TRIZA'TION, n. -trīz-ā'shūn, act of becoming or being rendered electric. ELEC'TRODE, n. -trōd [Gr. *hodos*, a way]: the extremity of a conductor through which the electric current enters or quits a body. E'LECTROL'YSIS, n. -trōl'ī-sīs [Gr. *lusis*, a loosening, a release]: analysis or decomposition effected by electricity, known often as *Electro-Chemistry*: see ELECTRICITY. ELEC'TROLYTE, n. -trō-līt, a substance capable of being analyzed or decomposed by electricity. ELEC'TROLYT'IC, a. -līt'īk, relating to electrolysis. E'LECTROM'ETER, n. -trōm'ē-tēr [Gr. *metron*, a measure]: instrument for measuring the strength of an electric charge. ELEC'TROMET'RICAL a. pertaining to. E'LECTROPH'ORUS, n. -trōf'ō-rūs [Gr. *phorēō*, I bear]: instrument for accumulating or condensing electric force; an electric induction machine. ELEC'TRO-SCOPE, n. -trō-skōp [Gr. *skopēō*, I see, I look out for]: instrument for ascertaining the existence and character of an electric charge. ELEC'TROSCOP'IC, a. -skōp'īk, relating to the electroscope. ELEC'TROTYPE, v. -trō-tīp [Gr. *tupōs*, a figure or image]: to deposit a film of copper by the voltaic battery upon a mold taken from types or woodcuts: N. the impression thus obtained, used to print from. ELEC'TRO-TYPING, imp. ELEC'TROTYPED, pp. -tīpt. ELEC'TROTYPED, n. one who. ELEC'TRUM, n. -trūm [L.], or ELEK'TRON, n. -trōn [Gr.]: amber; an alloy of gold and silver, gold ore of a light brass color and containing more than 20 per cent. of silver. ELECTRIC COLUMN, or DRY BATTERY, formed of numerous alternating disks of paper, silver-leaf, and zinc leaf; invention of De Luc; generating a feeble current when there is any moisture in the atmosphere. ELECTRIC CUR-RENT, the stream or flow of electricity when passing from one point to another. ELECTRIC EEL (see ELECTRIC FISH). ELECTRIC JAR, a jar so prepared as to be capable of being charged with electricity; a Leyden jar. ELECTRIC BAT-TERY, a number of prepared jars or cells connected with each other in order to obtain a powerful discharge of electricity. ELECTRIC DISCHARGE, the passage of elec-tricity from one body to another placed near it. ELECTRIC INDUCTION, the action of an electrified body exerted at a



## ELECTRIC BELL—ELECTRIC CLOCK.

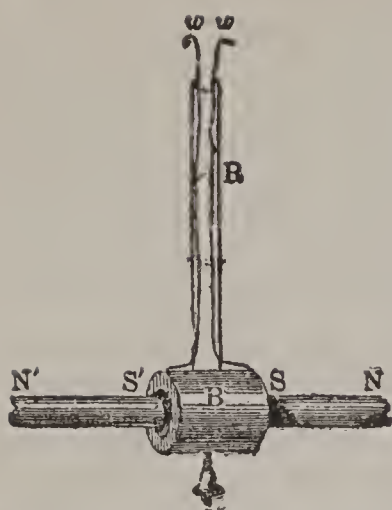
distance upon the electricity of another body. **ELECTRIC MACHINE**, an apparatus for producing electricity. **ELECTRIC TELEGRAPH**, an apparatus for conveying signals by means of voltaic currents passing through wires with prodigious velocity (see **TELEGRAPH**). **ELECTRIC FLUID**, the supposed matter of electricity; lightning. **ELECTRO-CHEMISTRY**, branch of chemistry which treats of the agency of electricity in effecting chemical changes (see **ELECTRICITY**). **ELECTRO-CHEMICAL**, pertaining to. **ELECTRO-DYNAMICS**, the science that treats of electricity in motion through conductors, etc. **ELECTRICAL UNITS**: see **UNITS, SCIENTIFIC**. **ELECTRO-MAGNET**, bar of soft iron bent in the form of a horseshoe, the sides being closely covered with layers of fine copper wire that has been incased in waxed thread—when its two free ends are connected with a battery it forms a magnet of great power. **ELECTRO-MAGNETISM**, science that treats of the power of electricity to impart magnetic properties to bodies: the magnetism developed by a current of electricity (see **MAGNETISM**: **DYNAMO-ELECTRIC MACHINE**). **ELECTRO-PLATING** (also **ELECTROTYPE**): see **ELECTRO-METALLURGY**. **ELECTRO-STATICS**, science which treats of electricity in a state of rest. **PYRO-ELECTRICITY**, electricity developed by heat.

**ELECTRIC BELL**: gong-bell set in action by an electro-magnet. The E. B. consists essentially of the gong-bell and an electro-magnet, the hammer of the bell being attached to the armature of the electro-magnet. Whenever the circuit is completed, as by pressing a button, the current passes to the armature by a spring, and thence to the electro-magnet: the core of the latter is thus magnetized, the armature attracted, and the hammer strikes the bell. The motion of the armature away from the spring breaking the circuit, the action of the electro-magnet ceases, the armature flies back, and completes the circuit again: thus as long as the current passes (or while the button is pressed down) the action of the hammer continues. See **BELL**.

**ELECTRIC BOATS**: boats or other small vessels propelled by electricity. The successful methods involve the use of storage batteries. A powerful battery of this description is stored away under the seats, and an electric motor is provided at the stern, driving a screw. Very good results have been obtained. The progression is almost noiseless. A gannet sleeping on the water has been approached and captured by one of these craft. Anthony Reckenzaun in England and Trouvé in France have given much attention to them. This feature of noiselessness may give extensive application to naval operations as part of fleet equipment.

**ELECTRIC CLOCK**: time-piece actuated or regulated by electricity. Electric clocks may be divided into two classes—those in which the impulse is given to the pendulum directly by electric power, and those in which it is given by a weight or spring alternately liberated and restrained by electricity. Of the first kind, that invented by Bain (1840) is best known. In the ordinary clock, the clock moves

## ELECTRIC CLOCK.



the pendulum; in Bain's clock, the pendulum moves the clock. As the construction of the pendulum is the only part of it connected with electricity, this notice is confined to a general description of the pendulum action. The lower part of the pendulum arrangement is shown in the fig. The bob, B, consists of a bobbin of insulated copper wire, and is hollow in the centre; the wires *w, w*, from both ends, run along each side of the pendulum rod, R (the lower part of which alone is seen), and are in

metallic connection respectively with the two springs from which the pendulum hangs. Two magnets or bundles of magnetic rods, NS, N'S', are fixed at either side of the bob, and are of such dimensions that the hollow bob in its oscillation can pass a certain way over each without touching. The magnets have their like poles turned toward each other. The two springs of the pendulum rod are in connection with the two poles of a galvanic battery. In the connection between one of these springs and the battery there is a break (not shown in the figure) worked by the pendulum rod. When the pendulum is made to move, say, toward the right, it shifts a slider, so as to complete the connection between the poles of the battery. The current thereupon descends one of the wires of the pendulum, passes through the coil of wire forming the bob, and ascends by the other. In so doing, it converts the bob into a temporary magnet, the south pole toward the right, and the north pole toward the left. In this way, the south pole of the bob is repelled by the south pole, S, of the right-hand magnet; and its north pole is attracted by the south pole, S', of the left-hand magnet, so that from this double repulsion and attraction, both acting in the same direction, the bob receives an impulse toward the left. Partly, therefore, from this impulse, and partly from its own weight, the pendulum describes its left oscillation; and when it reaches the end of it, it moves the slider so as to cut off the battery current, and then returns toward the right, under the action simply of its own weight. On reaching the extreme right, as before, it receives a fresh impulse; and thus, under the electric force exerted during its left oscillation, the motion of the pendulum is maintained. So long as the electricity is supplied, the pendulum will continue to move. The current required is exceedingly weak; but the imperfection of the battery originally used by Bain led to a strong prejudice against these clocks—stronger, certainly, than they merit. It has been found, however, by those who have employed them for astronomical purposes, that little dependence could be placed on them, and that the proper conditions of pendulum motion were, from the unsteady supply of electricity, in-



## ELECTRIC FISH.

terfered with. Hence the efforts of late in electric clock-making have aimed at rendering the pendulum independent of the irregularities of the motive agent.

A very important application of Bain's pendulum was made by Jones of Chester, England (1857). Shortly after the invention of Bain's clock, Prof. Wheatstone suggested that any number of such clocks could be made to move simultaneously by the same current of electricity. Jones turned this idea to account in the following way: A standard clock of the usual construction is made, by regulating the flow of a galvanic current, to control the action of any number of copying clocks, likewise of ordinary construction. The pendulum of the standard clock, itself in no way under electric control, on passing toward the right, touches a spring placed at the side, thereby completing the battery connection; and a current is transmitted to the copying clocks in a certain direction. On passing to the left side, the same takes place, but the current this time is sent through the circuit in the opposite direction. The pendulums of the copying clocks are made on Bain's principle, but have, of course, no break to move, as the primary pendulum performs that function. Let us suppose, at first, that all the pendulums are at rest; in this case no current is transmitted. Let the standard pendulum now be moved to the right, the right spring is touched, and a current at the same instant circulates through the bobs of the copying pendulums, and they thereby receive a simultaneous impulse toward the left. All the pendulums move then to the left; and on reaching the extremity of this oscillation, the standard pendulum touches the left spring, and the secondary pendulums are now impelled to the right. The motion of each secondary pendulum soon increases, until it reaches its proper extent. The pendulums once set a-going are, however, not intrusted solely to the stimulus of the electricity, but are moved by their own weights, as in ordinary clocks, so that, if the electricity ceased to be sent to them, they would go on without it.

In the second class of electric clocks, the electricity is not charged immediately with the maintaining of the pendulum motion, but draws up the weight or liberates the spring which discharges that function. This is the same principle as holds in what is known in horology as the 'remontoir' escapement. Ritchie of Edinburgh successfully combined the principles of Bain's and Jones's clocks, effecting the almost perfect control, by one standard clock, of a number of subordinate others. The pendulums of these controlled clocks vibrate by electro-magnetic action alone, and they consequently require no winding up.

**ELECTRIC FISH:** fish having the power of giving an electric shock. Electric organs are found in a few fishes; peculiar structures arising from a modification of muscular tissue, and capable under nervous control of a genuine electric discharge. The degrees of development vary greatly. The organs are powerful in the Electric Eel (*Gymnotus*), in the African Cat-fish (*Malapterurus*), and in the Electric Ray (*Torpedo*), in order of degree.

## ELECTRIC FISH.

They are weakly developed, or 'pseudo-electric,' as they used to be called, in all the Rays except *Torpedo*, and in several species of bony fishes (*Mormyrus* and *Gymnarchus*). Prof. Cossar Ewart has demonstrated a very rudimentary electric organ in the common skate.

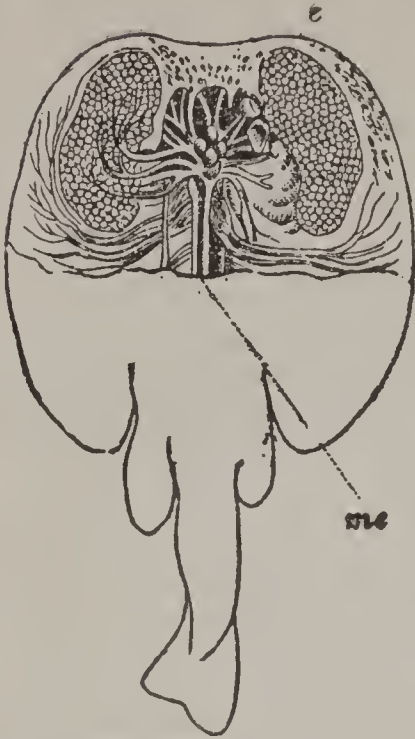


Fig. 1.—Electrical Apparatus of *Torpedo* (dissected):  
e, electric organs; me, spinal cord.

*Structure.*—It may now be regarded as demonstrated that all these electric organs are modified muscle-tracts. The associated nerve-endings are comparable to the ordinary terminations of a motor nerve on a muscle. The organs consist of a large number of rounded chambers or prismatic columns, separated by longitudinal and transverse partitions of fibrous connective tissue. In these partitions there are blood-vessels and nerves with very thick sheaths. The nerves lose their thick-

ness, branch greatly, and finally fuse with 'electric plates,' or disks of modified muscular substance. Besides the essential electric plate, the compartment may contain a jelly-like substance or a fluid. Partitions, nerves, and the 'electric plate' form in all cases the principal structures.

*Arrangement.*—The electric organs **not only** occur well developed in three very widely separated fishes, but the arrangement in each case is different. (a) In the *Gymnotus*, abundant in the fresh water of Brazil and the Guianas, they replace the lower muscles along the sides of the tail. This is the position also of the weakly developed organs in the Rays (except *Torpedo*) and in the bony fishes already mentioned. As *Gymnotus* may measure 6 ft. in length, and has a very long tail, there is little wonder that its electric discharge is emphatically dangerous. The whole apparatus is supplied with more than 200 spinal nerves; one inch in length contains over 200 chambers (Günther).

(b) In the African Cat fish, common in tropical Africa, and represented by *M. electricus* in the Nile, the organ is more diffuse: it forms a sheath almost round the

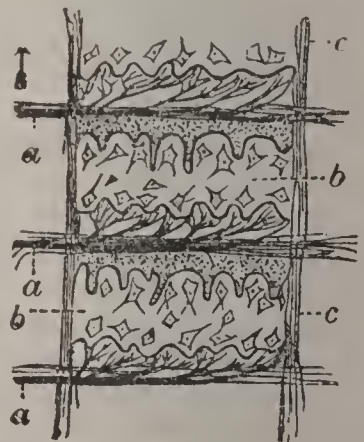


Fig. 2.—Section through Electric Chambers (greatly enlarged and semi-diagrammatic, from Wiedersheim and Parker):  
a, nerve breaking up into fibres; b, electric plates; c, connective-tissue walls of compartments.



## ELECTRIC FISH.

body, lying between the skin and muscles, but is thickest along the lower sides. The innervation is remarkable, for there is but one enormous nerve for each side. This arises from a giant cell high up on the spinal cord, and distributes branches throughout the body. The fish is very long, about 4 ft., and ranks second in the series. (c) In the Electric Rays (Torpedo), in the Atlantic and Indian oceans and in the Mediterranean, the organs are broad, bounded by the gills, the pectoral fins, and the head. The prisms, of which there are many hundreds in each battery, lie vertically, not longitudinally, as in the two preceding cases; and the nerves, instead of coming from the spinal cord, arise directly from the brain. Four of the five principal nerves on each side 'are each as thick as the spinal cord.' It is noteworthy that the above electric fishes all have smooth skins.

*Function.*—How the 'electric plates' come to be charged with electricity is not yet elucidated. The currents have all the usual characteristics of electricity: 'they render the needle magnetic, decompose chemical compounds, and emit the spark' (Günther). 'The side of the electric plate on which the nerve

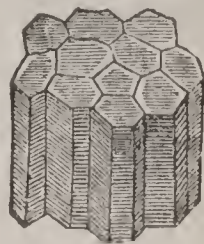


Fig. 3.—Electric prisms of torpedo.

branches out is negative at the moment of discharge, while the opposite side is positive; and from the different arrangements of the parts the electric shock passes in different directions in the three fishes—in *Malapterurus* from the head to the tail, in *Gymnotus* in the contrary direction, in *Torpedo* from below upward' (Wiedersheim and Parker). The activity of the organ is dependent wholly (a) on nerve stimulus from the brain, and (b) upon a certain degree of freshness in the structure itself. If the connection with the brain be severed, no discharge can be produced, except of course by the artificial stimulus of the severed nerves. Or if numerous rapidly repeated discharges have been already evoked, the organ is exhausted, and requires rest and recuperation before it becomes again functional. Humboldt's graphic story of the capture of electric eels by letting them first exhaust themselves in attacking horses has never been confirmed. In natural life the strength of the shock varies with the degree of development reached by the organ, with the size, health, and humor of the fish, and with the amount of reserve energy within the structure. A ray measuring 2 to 3 ft. in width is 'able to disable by a single discharge a full-grown man,' and yet the ray is the least powerful of the three. To receive the shock the object must complete the circuit by a double contact with the fish, either directly or through some intervening substance. When well developed, the organ may be useful to the fish in two ways—in paralyzing or killing fishes used as food, and in warding off attacks of enemies.

The electric ray and eel were known to the ancients, and were used for curative purposes, 'the earliest electric machines employed by mankind.' Scientific research on the

## ELECTRICITY.

electric organs really began with Walsh's demonstration (1772) of the genuinely electrical character of the discharge.

The origin of the organs, useless when incipient, and the connection between this peculiar development and the ordinary electrical properties of muscle and nerve, are unsolved problems.—See GYMNOTUS: MUSCLE: NERVE: RAY: TORPEDO: Batuchin in the *Arch. f. Anat. und Physiol.* (1876), for recent researches; Coldstream, article 'Animal Electricity' in Todd's *Cyclo. of Anat. and Physiol.* (1836-39), for old observations and stories; C. Gegenbaur, *Comparative Anatomy* (trans. by F. Jeffrey Bell, 1878); Günther, *Introduction to the Study of Fishes* (1880); Du Bois Reymond, *Gesammelte Abhandl. z. allg. Muskel- und Nerven-physik*, bd. ii.; R. Wiedersheim, *Comparative Anatomy* (trans. by W. Newton Parker, 1886).

















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